AMERICAN GAS JOURNAL

h YEAR AUGUST, 1947 VOL. 167, NO.

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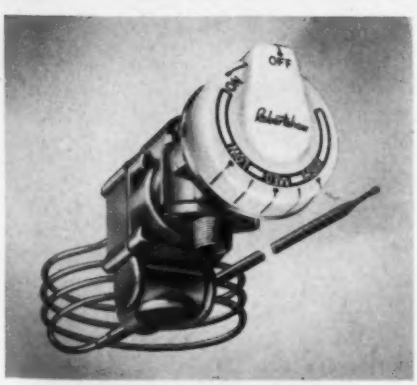

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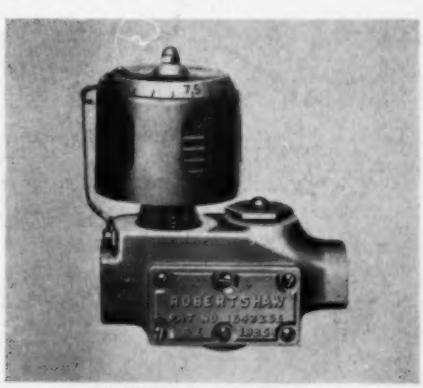

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QUALITY of workmanship and material and sound engineering are good reasons why Norwalk stays on top in the disc check valve field. But that's only part of Norwalk's story. Convenient stocks of Norwalk products at 11 branches help keep installation crews working without interruption. Norwalk also has qualified gas men at those same branches to help their customers with the tough problems.

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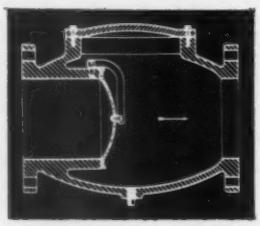

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Although operating temperatures in water gas generators are seldom too high for the refractories used, other severe conditions present tend to reduce the service life of natural mineral refractories. Much can be gained both in operating efficiency and long lining life by employing a Special Refractory. Such a refractory is the Norton CRYSTOLON line of bricks and shapes which stand the gaff in gas generator operation. Made of silicon carbide plus a minimum of refractory bond, these brick are very dense in the sense of low porosity and permeability, physically strong, chemically stable and highly refractory. They are unaffected by molten coal ash slag because it cannot penetrate their dense surface. CRYSTOLON linings often pay for themselves the first year by savings in cleaning costs alone. They will usually give from 10,000 up to 25,000 hours of trouble-free service . . . depending upon operating conditions.

NORTON COMPANY **WORCESTER 6, MASS.**

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This cast iron gas main, laid in Philadelphia, Pa., 111 years ago, is still in service.

This is certain: cast iron pipe has long life. Consider its record. The gas industry in this country was founded on cast iron pipe. Original cast iron distribution mains, installed from 60 to 113 years ago, are still in service. A comparison of the crude methods, by which this oldtime pipe was made, with modern production techniques, leads to but one conclusion: effective resistance to corrosion is inherent in the metal. Cast iron pipe is one of the few engineering materials in use today which remain unchanged in this respect from the product of olden times.

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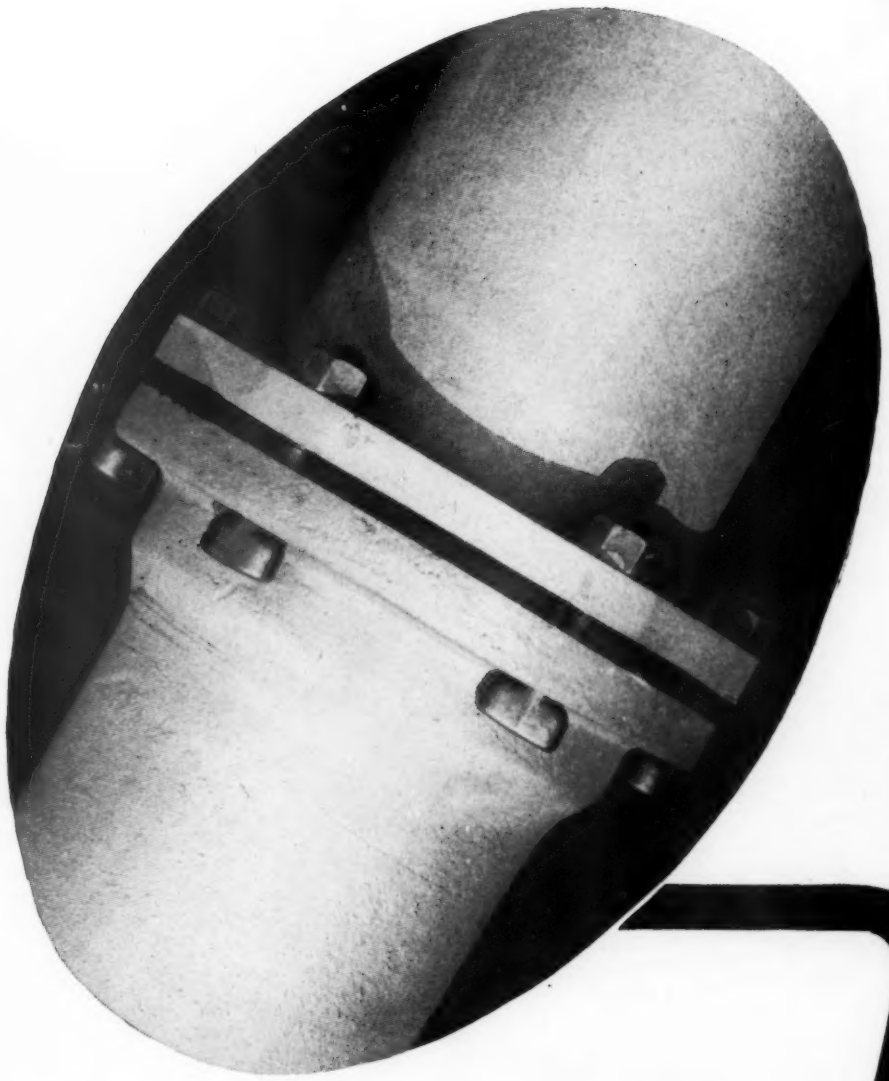
CAST IRON

Standardized **MECHANICAL JOINT**

PIPE

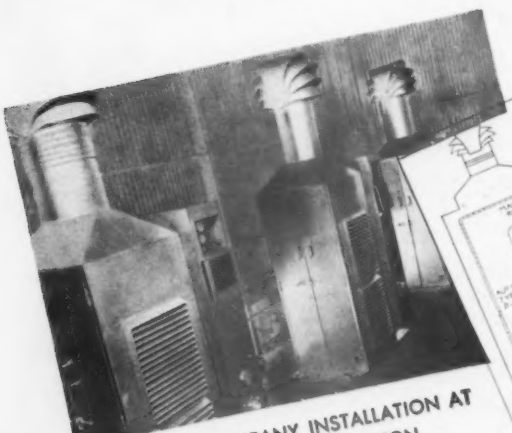


While the long-life records of cast iron pipe have been established by bell-and-spigot pipe, mechanical joint cast iron pipe offers long-lived, bottle-tight service for *all* pressures. Read what satisfied users say about it. "In all our 14 years of using mechanical joint pipe there has never been a single leak found" . . . "Any good workman can complete the joint as easily as he can change a tire on his car" . . . "The additional cost of the mechanical joint pipe was paid for many times by the labor saving and speed of construction." Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

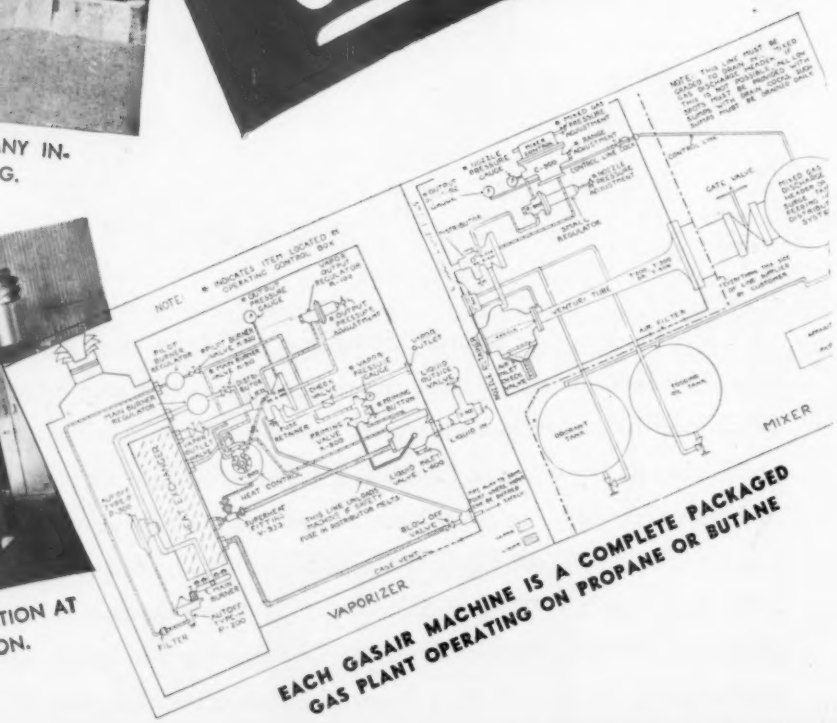
1 SMALL MID-WEST UTILITY INSTALLATION. CAPACITY: 15,000 C.F.H.

TO INCREASE SENDOUT choose...

2 LARGE EASTERN UTILITY COMPANY INSTALLS GASAIR FOR PEAK SHAVING. CAPACITY: 500 M. C.F.H.



3 UTILITY COMPANY INSTALLATION AT WALLA WALLA, WASHINGTON. CAPACITY: 75,000 C.F.H.



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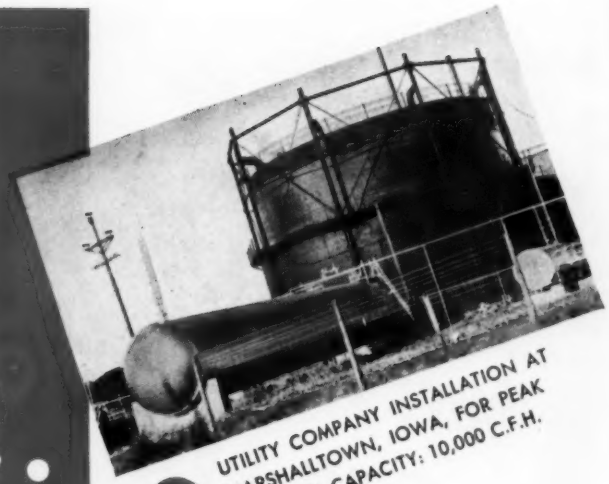
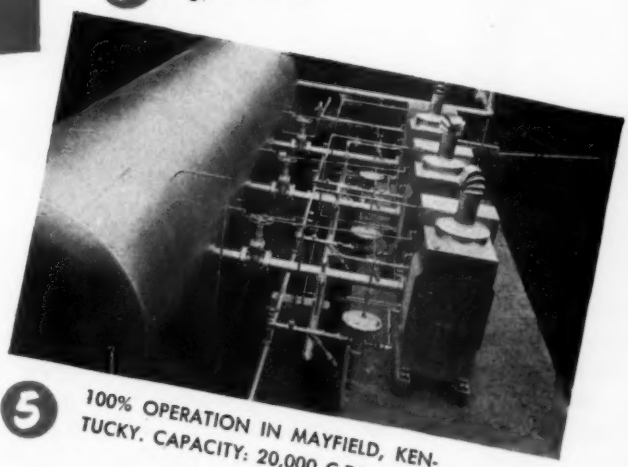


4 UTILITY COMPANY INSTALLATION AT MARSHALLTOWN, IOWA, FOR PEAK SHAVING. CAPACITY: 10,000 C.F.H.



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Number 2

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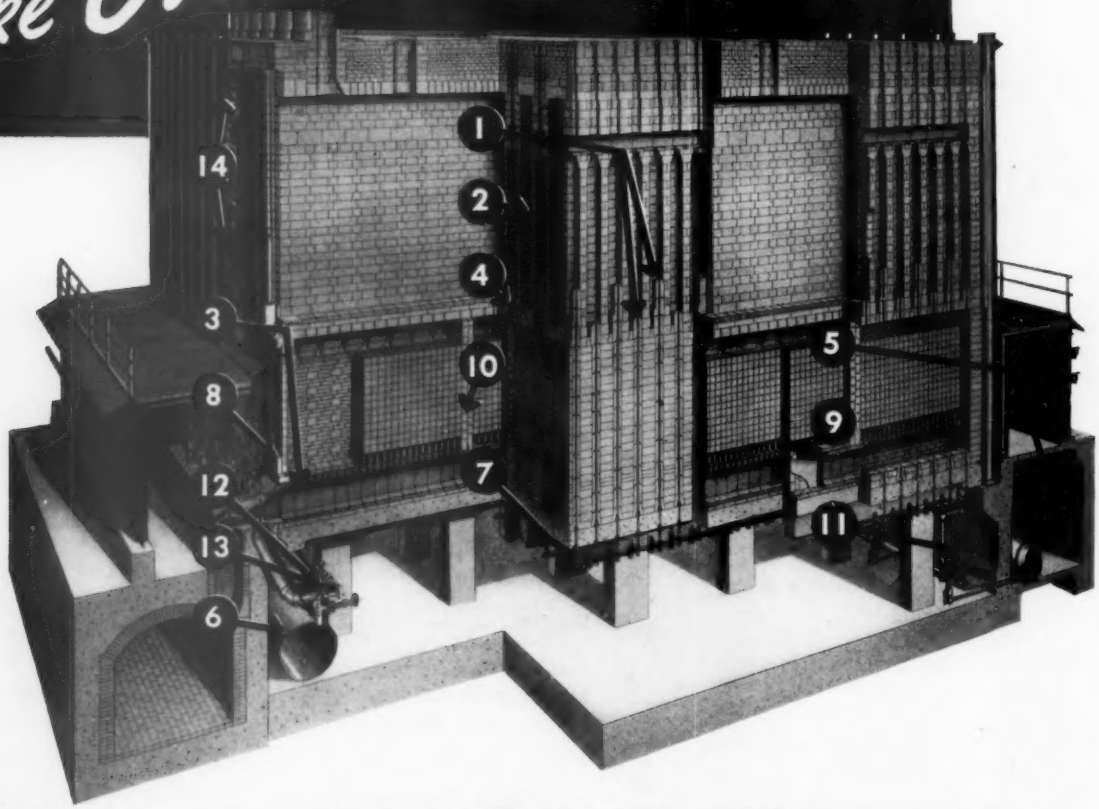
Some of the Reasons

why WILPUTTE Coke Ovens are Superior



1. Alternating high and low burners—*vertical uniformity in rich gas heating.*
2. Walls of unstepped thickness—*vertical uniformity in heating with lean gas.*
3. Venturi ports—*air, lean gas, and waste gases distributed uniformly through regenerators.*
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6. Orifice and butterfly—*lean gas at equal flow to each regenerator.*
7. Stainless steel pins—*precision distribution of rich gas to the burners, readily accessible for cleaning.*
8. Insulated steel face panels—*air tight, reduce loss of heat from regenerators.*
9. Metal flashing—*no leakage between bus flues.*
10. Short division walls, triple-thick—*the only regenerator area subject to cross leakage.*
11. Forced air system—*positive control of decarbonizing of burners.*
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15. Hydraulic door machines—*smooth operation, low maintenance.*

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AUGUST 1947

AMERICAN GAS JOURNAL

VOLUME 167 No. 2

New Plant Developments At Bay Shore

By
Charles A. Gallagher
Staff Engineer
Gas Production Department
Long Island Lighting Company

This is an abstract of a paper presented by Mr. Gallagher at a meeting of the New England Gas Assn., in May at Worcester, Mass. The operating data is not complete, but the article covers the essential data on the new installation.—Ed.

THE Long Island Lighting Company supplies gas to the whole of Long Island outside the New York City limits, plus that gas consumed on the Rockaway peninsula, which is within the New York City limits.

This gas is produced by three interconnected plants located at Rockaway Park, Hempstead, and Bay Shore.

Due to normal growth in population and industry, the demand for gas was increasing considerably. Then came the war and with it an influx of industry and potential customers that would most certainly mean a tremendous increase in gas sales.

Management, after studying the system increase, decided that the increase in gas sales would no doubt continue into the postwar years, and therefore, realized that some additional generating capacity was necessary in the system.

A study of the existing production plants and inter-plant transmission facilities indicated that an additional carburetted water gas set would best be located at the Bay Shore Gas Works. This would meet the increase in demand for Suffolk County, and provide an excess that could be delivered to the South Shore of Nassau County which was at that time supplied with gas from the Rockaway Park Gas Works.

Present figures for the "sendout" from Bay Shore plant has shown an 80% increase in 1946 over that of 1940, while the system "sendout" has increased 39% over the same period.

With the installation of the new gas machine, it was also necessary to install additional gas processing equipment to take care of not only the additional generating capacity, but to eliminate existing bottlenecks as well.

The major items, many of which have been installed and are now in use, are as follows:

11'-0" Water Gas Set

A Semet-Solvay Reverse Flow Water Gas Set was installed at the Bay Shore Plant and put in operation July 15, 1946.

This set has a water jacketed generator, the I.D. of which is 9'-0" and a S.S. Type L-R mechanical grate installed therein, as shown at "A" on figure WG-1. The grate is the first of its kind used in this country in a carburetted water gas set. The carburettor is elevated and reverse flow with an O.D. 10'-6" and I.D. 8'-8". There is a dome or "doughnut" installed just above the cone bottom with a center opening 40" in diameter (B, Figure WG-1).

The generator-carburettor connection is connected tangentially to the cone bottom of the carburettor and the secondary air connection is in the G.C. connection between the generator and carburettor.

The Superheater is also Reverse Flow with an O.D. of 11'-0" and I.D. of 9'-2". This shell is checkered, staggered 2½" openings top to bottom. The wash box is fitted with a cone bottom and is 10'-0" O.D.

The reversing valve is a Steere 3-way valve fitted with the necesary sprays for using heavy oil.

Oil sprays in both carburettor and generator are Anthony type sprays, the one in the carburettor has a five spud head, while the generator spray has a single spud head.

A Semet-Solvay waste heat boiler is also a part of this installation.

A U.G.I. 9 lever automatic control is used for operating all valves which are hydraulically controlled.

Oven coke with an average ash content of 9% and a fusion point of from 2,600 to 2,700° F. is used as generator fuel.

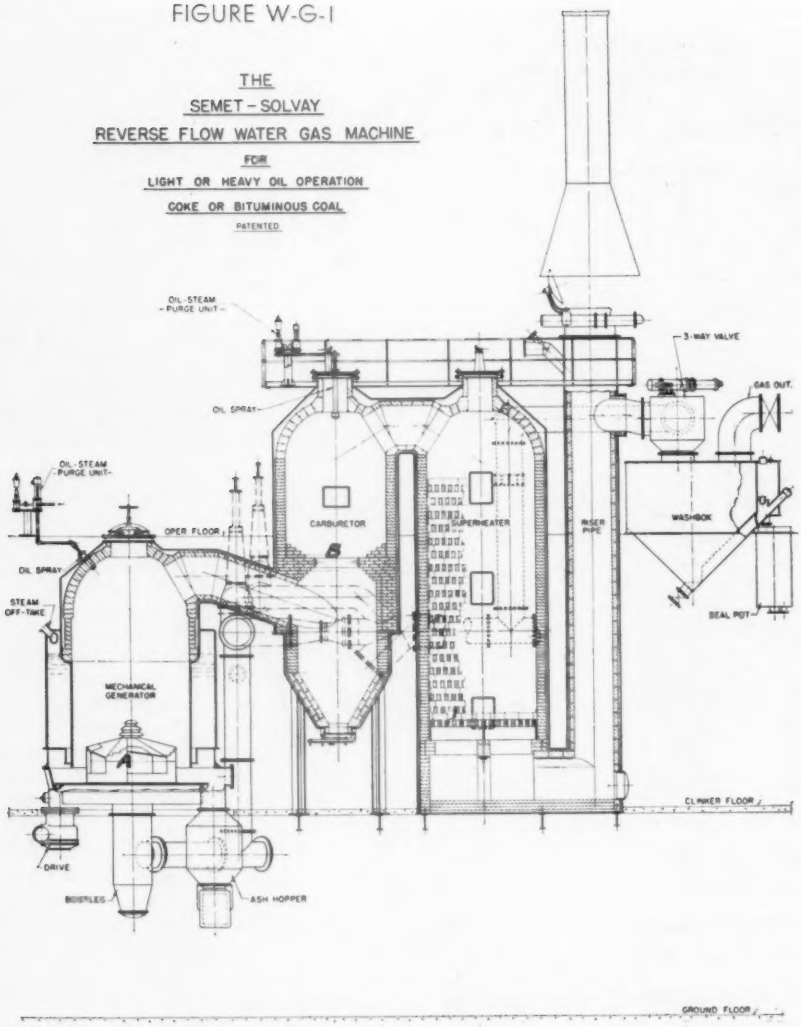
Heavy oil having a Conradson Carbon of between 9 and 11% and a sulphur content of approximately .7% is used for enriching.

The oil is heated to 220° F. and the spray pressure is between 125-135 p.s.i.g.

We have not attempted to do much reforming up until this time, and all the oil is sprayed into the carburettor at rates varying from 60 to 90 gallons of oil per run, depending upon the B.t.u. of the finished gas. The carburettor spray is designed to deliver 70 gallons per minute at 125

FIGURE W-G-1

THE
SEMET-SOLVAY
REVERSE FLOW WATER GAS MACHINE
FOR
LIGHT OR HEAVY OIL OPERATION
COKE OR BITUMINOUS COAL
PATENTED



p.s.i.g., while the generator spray is designed for 30 g.p.m. at 125 p.s.i.g.

Some difficulty has been experienced in getting enough air through the present grate and the Semet-Solvay Corporation have redesigned a section of the tuyere. This design will increase the total grate opening approximately 20% based on the entire grate surface.

Since the installation of a "doughnut" in the carburettor, we have experienced no trouble from carbon deposits, and while a carbon formation can be seen above the "doughnut," it does not interfere with oil decomposition nor gas flow.

Once each 24 hours, the bottom cleanout door of the carburettor is opened and approximately 50 pounds of carbon and ash removed. This operation takes from 5 to 10 minutes from opening to closing of the cleanout door and is done simultaneously with other routine work in the morning so that there is no lost time from this operation.

Due to load conditions, we have had to operate this set continuously and the carbon formations at no time were excessive, so that natural scurfing in the carburettor was not resorted to.

To date we have experienced no trouble from ash deposits in the bottom of the superheater nor riser pipe, nor tar troubles in our cone bottom wash box.

Carburettor air rates are carried somewhat higher than in the conventional type carburettor. We have found for present operation that an air rate of 7,500 to 8,000 c.f.m. in the carburettor is sufficient to burn all carbon monoxide produced on the blast and keep carbon formation at a minimum.

We consider this excellent as the carburettor has handled from October 21, 1946, to March 31, 1947, 1,980,600 gallons of 13° Be. oil having an average Conradson Carbon of 10.5%, with absolutely no trouble from the carbon formation in the carburettor.

Blower

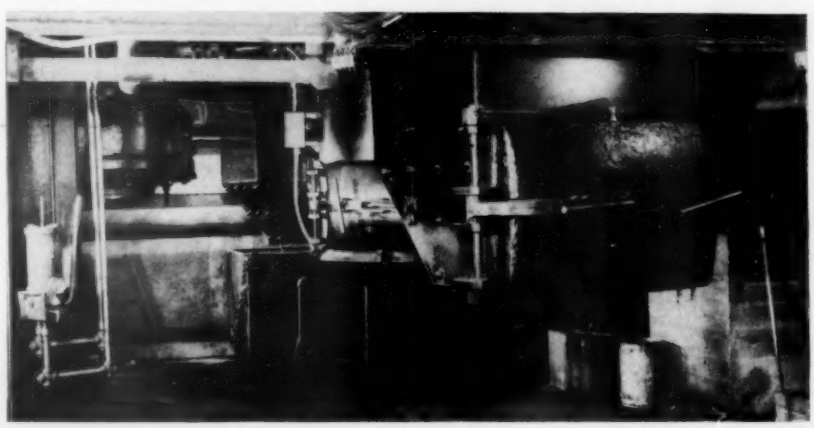
An Ingersoll Rand centrifugal, single stage, single flow blower of the overhung type, connected to a Terry Steam Turbine by means of a flexible coupling was installed for additional blower capacity.

Bearing lubrication is force fed at 10 p.s.i. by a cam type pump mounted in the bearing pedestal. An auxiliary motor driven oil pump is part of the unit, and when the oil pressure falls below 2 p.s.i., this pump starts up and maintains the pressure at 5 p.s.i. When the oil pressure reaches 6 p.s.i. the auxiliary unit shuts down.

The blower is designed to deliver 30,000 c.f.m. at 60" pressure with throttle steam at 105 p.s.i., back pressure of 15 p.s.i. and at approximately 2,950 r.p.m. or 37,000 c.f.m. at 80" pressure with throttle steam at 175 p.s.i., back pressure 15 p.s.i. and at approximately 3,450 r.p.m. Intake temperature to be 60° F. and intake pressure, atmospheric.

Blower Control

Due to the fact that the plant is situated in a residential section close



Installation of Automatic Grate showing ash hopper

to the center of town, noise elimination is quite important, if good public relations are to be maintained.

The problem was discussed with the manufacturers of control equipment and a type of control was decided upon that would help to control blower noise, and at the same time, control the speed of the turbine to hold constant blower pressure.

This would also save steam due to the fact that the blower turbine would use no more steam than was necessary to drive the fan at a speed sufficiently high to maintain a predetermined pressure in the blast main. The use of Solenoid valves would also allow us to run the blower at idling speed, when there was no demand for air, which would also result in a saving of steam.

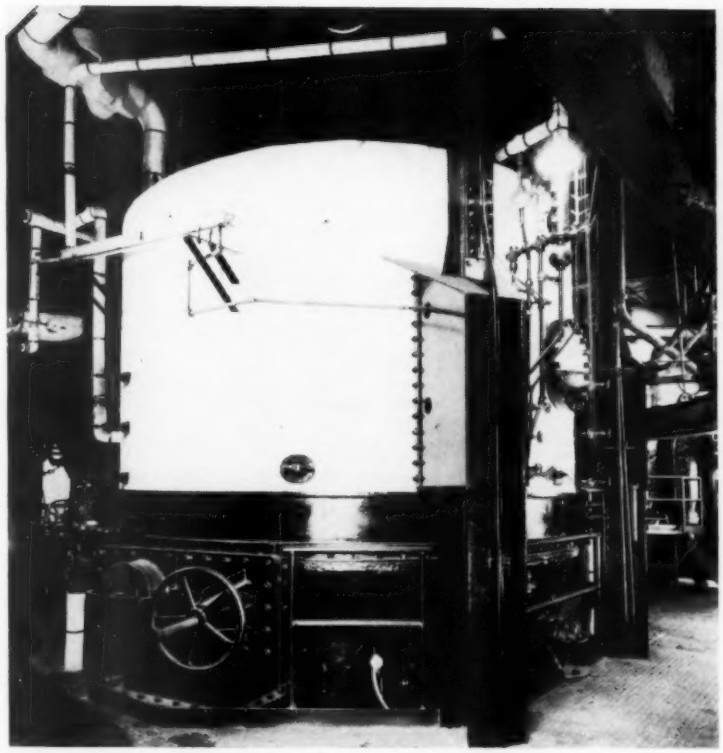
A control panel was located in the blower room on which a main Pressure Regulator, Air Flow Regulator, Totalizer, Solenoid Valves, and various reducing valves on the high pressure air lines are located.

A manual control station is located on the gauge board of Number 5 gas machine to provide a method of controlling the blower should it be desired or found necessary to go from automatic to manual control.

The system was set up with two main regulators, one controlling the action of the inlet air and by-pass dampers; the other controlling the action of the turbine control valve.

While the main regulators have independent loading lines, the action of the controlled units are correlated; inasmuch as any change in position of the turbine control valve resulting in a change of air flow is reflected in an immediate change in the position of the Inlet Air Damper. This is also true of the By-Pass Damper provided the air used by the gas machines is below the "Pumping Limit" of the blower. When the air used is above this point, the By-Pass Damper remains in a closed position.

The Pressure Regulator is used to control the opening of the turbine control valve in the steam line to the turbine, thus controlling the speed of the turbine in order to maintain a predetermined pressure in the blast main.



Semet-Solvay Mechanical Generator for Water Gas Machine

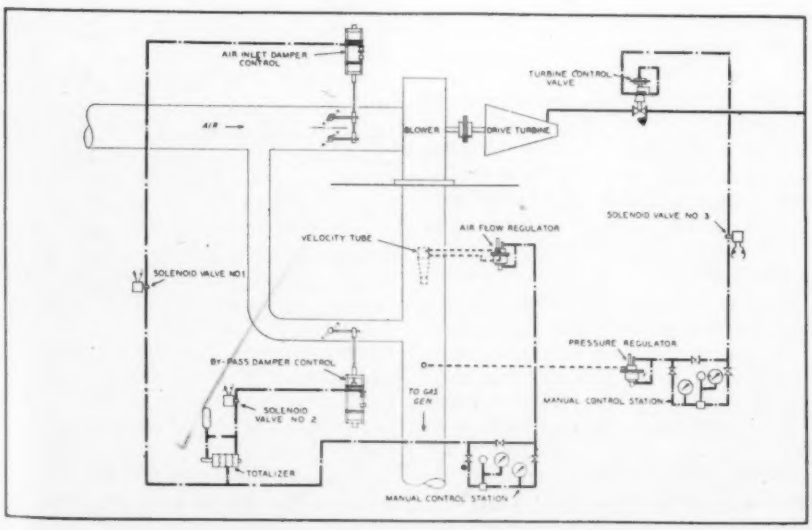


Figure B1

Figure B-1 is a simplified diagram of the system showing the main units.

The Pressure Regulator is set to maintain a predetermined pressure in the blast main, while the Air Flow Regulator is set just above the "pumping limit" of the blower.

Any change in flow through the velocity tube installed in the blast main results in a change in differential pressure on the diaphragm of the Air Flow Regulator.

A movement of this diaphragm changes the setting of the escapement valve, changing the loading line pressure to both the Air Inlet Damper Control and the By-Pass Damper control, in the case of the By-Pass control through the medium of the Totalizer, and positions the Dampers in accordance with the air demand on the Blower. When the demand is above the "pumping limit" of the Blower the By-Pass Damper is in a closed position.

Any change from the predetermined pressure maintained in the blast main is transmitted to the top of the Air Pressure Regulator diaphragm moving the diaphragm and changing the setting of the escapement valve. This changes the pressure in the loading line to the Turbine Control Valve and positions this valve to admit enough steam at a pressure required to drive the blower at a speed sufficiently high to main-

tain the predetermined pressure in the blast main.

The Solenoid Valves in the control lines to the Turbine Control Valve, the Inlet Air Damper Control, and the By-Pass Damper control are used to position all controlled units in whose lines they are installed and to bring the blower to an idling speed, when there is no demand for air.

These Solenoids are energized to close and de-energized to open, so that in case of a power failure we could still operate.

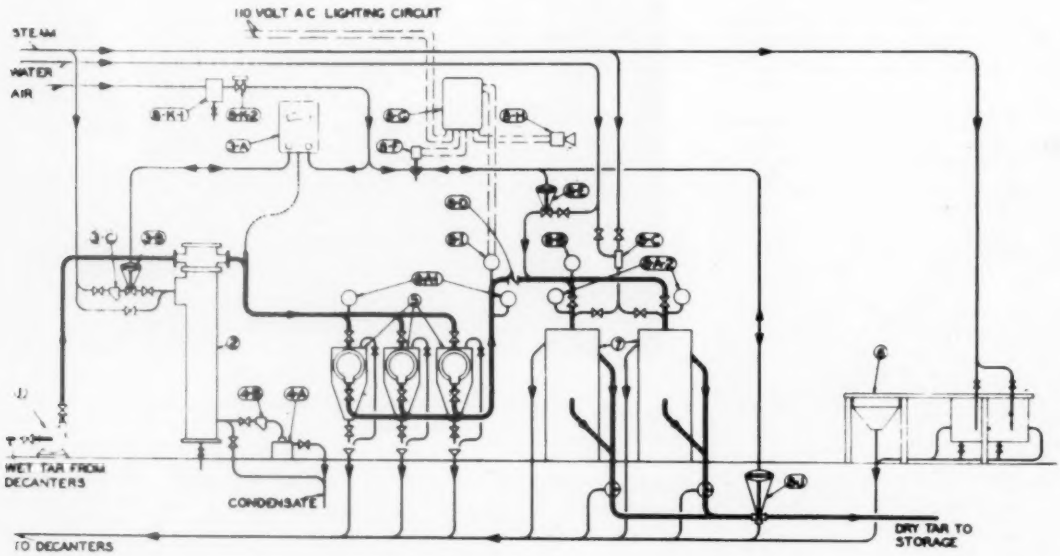
approximately 70% was being used in the other gas machines, it was necessary that the new washer cooler be of the "Dry Bottom" type and the old unit be converted from a "Wet" to a "Dry Bottom" also.

A Phillips type tower will be used to cool the water which has been heated in passing over the cooling coils.

The spray liquor is pumped from the separator through the cooling coils, where the temperature is reduced, and then through the Washer

Tar De-Emulsification

At the beginning of last winter's peak load period, it was made evident that our existing tar emulsion treatment system was inadequate to care for the larger amount of emulsion produced as a result of a substantial increase in the amount of gas produced and the use of a larger percentage of heavy oil used in the gas making process. It was also found that the type of emulsion being produced did not separate readily by the heat and pressure method used



1	FEED PUMP	8B	THERMOMETER
2	TAR HEATER	8C	MIXING TEE
3A	TEMPERATURE CONTROL	8D	CHECK VALVE
3B	TEMPERATURE CONTROL VALVE	8E	WATER CONTROL VALVE
3C	STEAM STRAINER	8F	AIR PILOT VALVE
4A	STEAM TRAP	8G	MAGNETIC RELAY
4B	STRAINER	8H	ALARM
5	FILTER	8I	PRESSURE SWITCH
6	CLEANING TABLE	8J	DIVERSION VALVE
7	TAR DRIER	8H1	AIR FILTER
8A1	PRESSURE GAUGE	8H2	AIR PRESSURE REDUCING VALVE
8A2	PRESSURE GAUGE		

Figure C1, Flow Sheet, Sharples Dehydration process

Washer Cooler

A 6'-6" x 57'-8" "Wet Bottom" Washer Cooler good for 5,000 M.C.F. per day had been installed on the outlet of the relief holder in 1927.

In 1941 when an 11'-0" U.G.I. gas machine with mechanical grate was installed, the company installed a U.G.I. water tube condenser good for 500 M.C.F. per hour on the inlet to the relief holder. As these units were now too small, it was decided to install an additional Washer Cooler on the relief holder outlet.

The new Washer Cooler is 9'-0" x 60'-0" and designed to cool approximately 13,000 M.C.F. of gas daily. As the new gas machine was to use 100% high carbon oils and Cooler liquor sprays, where it is sprayed over the scrubber grids and falls to the bottom of the Washer Cooler. From here, the hot liquor flows into a seal pot and thence into the separator, where the tar and water separate, and the cycle is then repeated.

Holder water is utilized as cooling water on the cooling coils and flows from the water tank of our storage holder over the bank of coils by gravity, and is collected in a sump beneath the coils from which it is pumped to the spray tower where it is cooled by the action of an inducted draft fan circulating the air, before being pumped back to the storage holder water tank.

in our de-emulsifiers.

It was decided that the best way out of our difficulties was the installation of one of the new type centrifuges designed to handle tar emulsions containing a considerable amount of free carbon. We had previously used the old type centrifuges in the days when no heavy oil was used, and had obtained very satisfactory results. However, when we started using heavy oil in the gas making process, considerable difficulty was experienced in keeping the centrifuge bowls clean; cleaning time became excessive and the use of these centrifuges were abandoned.

The equipment of a complete centrifuge treating system was immediately ordered, but as deliveries could not be made in time for operation for the winter load, we prevailed upon the manufacturers to loan us a demonstration model which they had on hand. A purolator essential for the operation of this system was kindly loaned to us by the Brooklyn Union Gas Company and the balance of the equipment was on hand or obtained immediately from distributors. This enabled us to set up the

centrifuge treatment system in a temporary manner, but it was necessary to control the operations manually.

The final arrangement will be almost entirely automatic and Figure C-1 shows diagrammatically a manufacturer's arrangement using three purolators and two centrifuges. Emulsion is taken from the pretreatment settling tanks by means of a centrifugal pump and is delivered to the purolators where it is passed through a .015 screen and then delivered to the inlet pipes of the centrifuge bowl. The centrifuge has three outlet pipes which discharge water, light tar and heavy tar. The light tar and heavy tar lines are piped to a common delivery line to the tar storage tank. The water is returned to the tar separator. The equipment on the extreme right is a specially designed bench for the cleaning of the centrifuge bowl.

Operating with an emulsion containing 40% water, the output of dry tar was 600 gallons per hour, the tar having a water content of less than 2%. These results were obtained using a standard .035" diameter nozzle, and it was found necessary to clean the bowl after approximately 72 running hours. In an effort to increase the running time between cleans, the .035 nozzles were replaced with nozzles of .052" diameter and the continuous running time amounted to approximately two weeks. This resulted in an increase of capacity to 1,100 gallons of dry tar per hour, but the water content increased to between 2% and 5%. We feel that best results for our operation may be obtained with .042 diameter nozzles. These are being made by the manufacturer and obviously we have no data regarding operation with this size nozzle at this time.

Additional Equipment

During the winter season of 1946 to 1947, the Long Island Lighting Company experienced a tremendous increase in gas sales. In fact our system "Peak Day" for the winter 1946 to 1947 was 46,467 M.C.F., an increase of 26.5% over the "Peak Day" for the winter of 1945 to 1946, while our system "Average Day" for the period from November 1, 1946, to March 31, 1947, was 33,976 M.C.F., an increase of 36.4% over the same period in 1945 to 1946.

In order to obtain equipment that would augment our present generating capacity in time to meet the forecast increase in gas sales for the winter heating season, we are making L.P. gas installations.

CATALYTIC CRACKING PLANT
Material Requirements and Analysis Comparison

	Carburetted Water Gas	*Gas from Catalytic Plant*	
		Matched	*Interchangeable*
Plant Capacity	— —	75 MCF/Hr.	104 M c.f./Hr.
B.T.U. Finished Gas	540	540	579
Specific Gravity	.67	.67	.84
Materials			
Reaction Propane	— —	3,400 c.f.h.	4,720 c.f.h.
Enriching Propane	— —	6,500 c.f.h.	11,900 c.f.h.
Steam	— —	325 lbs./hr.	— —
Air	— —	12,600 c.f.h.	32,400 c.f.h.
Heating Oil	— —	72 gals/hr.	72 gals/hr.
Analysis * Finished Gas			
CO_2	5.8	0.6	0.5
Illuminants	8.4	— —	— —
C_3H_8	— —	13.0	17.0
O_2	0.5	— —	— —
CO	26.7	22.5	19.5
H_2	31.0	41.0	25.9
CH_4	14.5	0.6	0.6
N_2	13.1	22.3	36.5
Total	100.0	100.0	100.0

Propane Catalytic Cracking Plant

The chief advantage of this type of plant is that it can be operated to produce a gas that compares closely in physical properties and chemical composition with the carburetted water gas delivered to our mains. To meet peak demands, it can also be operated to produce an interchangeable gas of higher B.t.u. and specific gravity, which method of operation results in an increase in production from the plant of approximately 25%. Once started up, the plant is almost entirely automatic in operation, and has considerable flexibility in the amount and character of the gas produced. The controls are capable of operating the plant at varying production rates from 5% to full capacity.

The catalytic cracking plant consists of three cracking furnaces. These are vertical rectangular steel shells, refractory lined and mounted on a steel structure, 9 feet above the ground. They are approximately 11 feet square and 24 feet high. Suspended from the top of each furnace, are 8 cracking tubes cast of 30-chrome-20-nickel alloy, which are 6" I.D. approximately 26 feet long, of which 20 feet is within the furnace chamber.

Each furnace will be heated by 15 oil burners located at the bottom and arranged to uniformly heat the tubes. At the top of each tube is a tubular condenser for primary cooling of the gas and at the bottom is a flexible connection to the manifold through which the proper mixture of air propane gas and steam is supplied to the tubes.

The cracking furnaces are automatically controlled to maintain a temperature within the furnace of 1,850° F. by means of electric-resistance type thermometers and electrically operated control valves at the burners. The output from the plant is also automatically controlled according to the load demand which affects the pressure at the outlet of the furnace, the control being set to maintain a pressure of 25 p.s.i. at this point.

When operated, to produce a matched gas, i.e., 540 B.t.u. or .67 gravity, steam is used along with air and propane, and the resulting gas at the outlet of the cracking tubes is essentially hydrogen, carbon monoxide and nitrogen with a heating value up to 310 B.t.u., depending on the amount of air used. The gas leaving the primary coolers passes through secondary coolers of the washer cooler type and then enters a mixing chamber into which is also injected propane gas from the vaporizer in amounts sufficient to give the desired heating value. The mixed gas is taken from the mixing chamber by means of a steam-driven compressor which boosts the pressure up to 75 p.s.i. for delivery to the transmission system.

When operated for maximum capacity producing an interchangeable gas of higher B.t.u., no steam is used in the cracking tubes.

The above table shows the approximate analysis, heating value, and specific gravity that is expected to result by the two methods of operation, compared with the gas normally supplied and also shows the quantities of propane air and steam required.

I express my appreciation to V. A. Dalton, Staff Engineer, and S. W Horsfield, Gas Production Manager, for their cooperation in the preparation of this paper.

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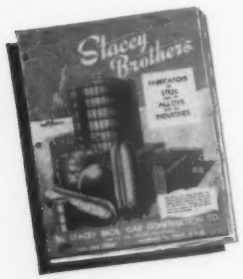

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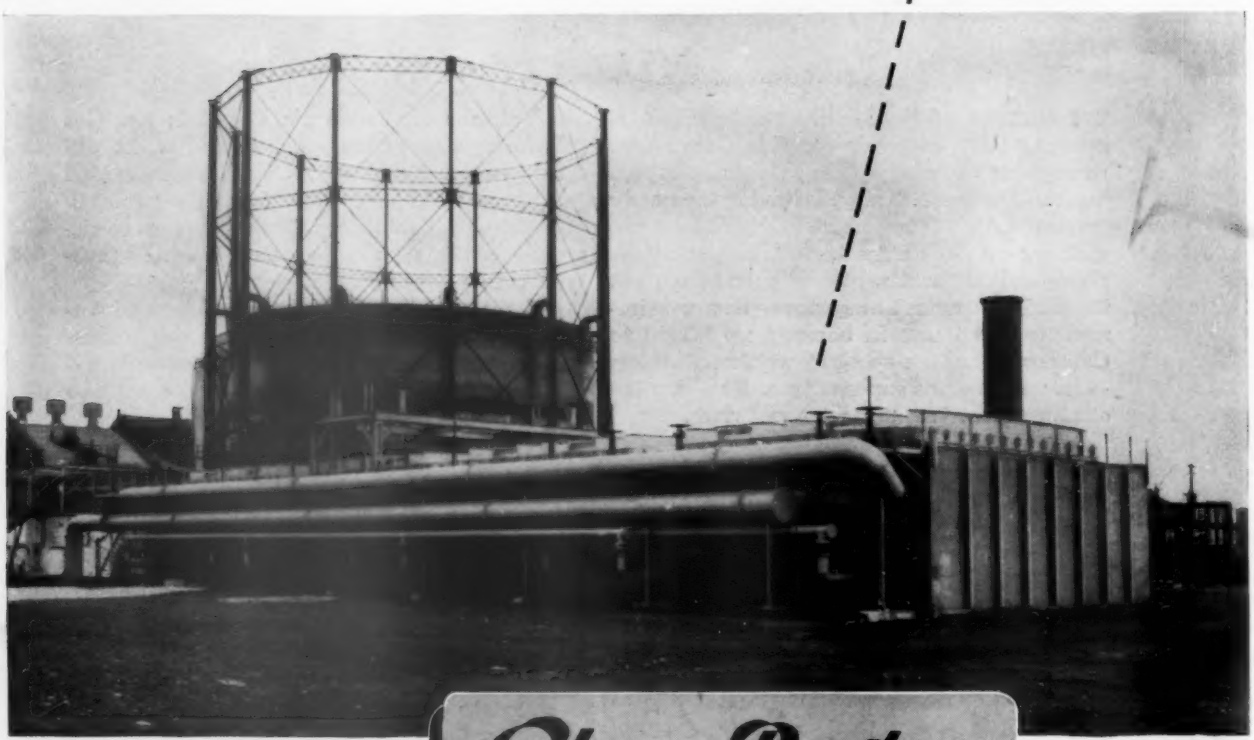

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The Economics of Supplying Gas to Outlying Areas

By

Henry W. Battin

Senior Engineer
Philadelphia Electric Company

DURING the last few years the house heating loads in many gas companies have increased greatly. In fact, the house heating load now available, if taken on, would at least double present gas demands in the next five years in our territory. At the same time there has been, and probably always will be, a tendency for people to move from the thickly built-up districts to the so-called outlying areas. Consequently, many companies are going to be faced with the problem of supplying large quantities of gas to these outlying areas. In some cases this may mean supplying a new building development, in others it means augmenting the supply of gas in existing, growing areas.

The purpose of this paper is to discuss the economics of supplying gas to these outlying areas.

Each individual gas company has its own local problems; in fact, the problems differ in various locations in a single gas company. Hence, no set rules or formulae can be laid down. The answer to each problem is affected by the size and location of production plants, gas storage facilities and pumping stations in existence, the type of distribution system, that is, low pressure, intermediate pressure or high pressure, and many other factors. Consequently, each company must make its own study and solve its own problems, taking into account various possible methods which may be employed to supply the area in question, and the factors entering into the solution of the problem.

Therefore, it was decided to devote this paper to a general outline of various methods of supplying gas to outlying areas, a discussion of various factors which must be considered in solving the problem and citing here and there through the paper how the problem was solved in several situations in the Philadelphia Electric Company.

First Method

The first step toward solving the problem is to estimate as accurately as possible the load in the outlying area in question. This must be on a basis of maximum hour, maximum day, and annual. The maximum hour and maximum day determined for problems in the Philadelphia Electric Company are based on a day when the average atmospheric temperature is 10° F. On such a day there will be 55 degree days.

Studies should be based on a future period of at least five years, then consideration should be given to the probable loads beyond the five-year period in order to see how the proposed method of supply and the proposed investment may fit into the picture beyond the five-year period.

In the Philadelphia Electric Company, when determining our loads we start with annual sales by classes, such as domestic, commercial, industrial, house heating, and other utilities. We also have customers by classes at the end of each year. The annual sales are converted to sendout, after which the maximum day sendout is determined for various classes. The hourly sendouts by classes are next determined in order to see which combined total produces the maximum. To calculate these various loads we make use of figures obtained several years ago when we made tests of loads of a large number of customers of various classes in order to determine their load characteristics, diversity, etc.

Our hourly domestic load is greatest on a weekday between 5 and 6 P.M. The hourly house heating load is greatest on a weekday between 7 and 9 A.M. We do not consider Sunday loads for the company as a whole because our maximum days and hours occur on weekdays, probably due to our large industrial load.

In our case the combined maximum hour occurs between 7 and 9 A.M. on a weekday. However, the maximum hour in each district or political subdivision in our territory does not necessarily occur between 7 and 9 A.M., and it does not necessarily occur on a weekday. The time is influenced by the proportions of various classes of sales, and the load characteristics of each class. The maximum hour in any one area may occur at almost any time from 7 A.M. to 6 P.M., especially if it contains a large industrial plant which may use its maximum quantity of gas at any time during that period.

In some situations it may be necessary to increase the B.t.u. in the gas sent out on maximum days in order to provide proper interchangeability of peak gas with base load gas. Where this increase in B.t.u. is anticipated, the estimated sendout should be reduced proportionately.

Summarizing the matter of loads, it is important to determine carefully the maximum hour sendout and the time of its occurrence, the maximum day sendout and the annual sendout. Naturally the estimated annual sales and revenue will be known.

Second Method

The second step in solving the problem is to consider various methods of supplying the estimated load. Probably certain methods can be immediately eliminated because they are not feasible. For instance, it may be undesirable or impossible to erect and operate an L.P. gas-air or a catalytic reforming plant in, or adjacent to, a residential area.

Now let us see what various methods can be used for supplying gas to an outlying area. This paper is not concerned with distribution of gas in a development or area, but only in getting the supply to a point where it can feed into the local distribution system.

The first method to be considered is the use of mains. The main or mains supplying the area under consideration should be of sufficient size to supply the maximum hour demand and maintain adequate pressures. It is not necessarily economical to run the new main along the shortest route. There may be situations where a slightly longer route will open up new territory and result in additional customers and be more economical. In case an area is already supplied by a main which has become inadequate, it may be desirable to run a new main by a new route, or to reinforce the existing main for part of its length. This reinforcement can be on the same route as the existing main or on a new route. In calculating main capacities,

consideration should be given to existing or new take-offs. I wish to say here that we use the Weymouth Formula for computing gas flows. In designing any main or system of mains, consideration should be given to requirements even beyond the five-year period of the study. It may be desirable in some cases to install a main larger than will be required during a five year period, in order to fit into the ultimate picture. This is a matter that requires careful consideration, because naturally it is not desirable to install property that will not be required for many years in the future.

Main capacity can be increased by converting an existing main to higher pressure; for instance, an intermediate pressure main can be converted to high pressure, although this may not always be possible or advisable. Or, a high pressure main can be operated at a higher pressure than was intended at the time the main was installed. As an example, the compressors at our West Conshohocken Plant were purchased as 100 psi machines. Recently we have considered raising pressures above 100 psi. The compressor manufacturer was consulted regarding this matter and investigation indicated that some of our 100 psi compressors can be operated safely at 125 psi pressure without any appreciable loss in capacity. In the future, any high pressure compressor we install will be built for 125 psi operating pressure. Incidentally, increasing the initial pressure from 100 psi to 125 psi will increase the carrying capacity of a main anywhere from 20% to over 50% depending upon the relation between the initial and terminal pressures. In this case we will save considerable investment in reinforcing mains by raising the pumping pressure during maximum sendout periods. Of course, the matter of economics enters the picture, because the higher pressures will result in higher pumping cost and probably additional unaccounted-for gas ,and this must be compared with the fixed charges and operation of the new main otherwise required.

Gas Storage

I might mention here the matter of gas storage in a system of high pressure mains. In the Eastern Division of our company, which comprises Bucks County and a part of Montgomery County, we have an extensive system of high pressure trunk mains. The cubical content of those mains is over 125 MCF. Therefore, if we should permit the average pressure in that system to drop one atmosphere, say from 60 psi to 45 psi, there would be used from the mains approximately 125 MCF more gas than was supplied to the mains. In other words, we would be using gas stored in the mains. In some situations the gas stored in a system of high pressure mains may be considerable. However, in our calculations of facilities required to supply an outlying area, we take no account of this stored-up gas. We believe that it should be considered only as a factor of safety.

The second method of supplying gas to an outlying area is by means of an existing main and the installation of gas storage facilities to provide gas during maximum hours. For a situation of this kind, the volume of gas delivered by the existing main plus the gas fed or pumped from the storage facilities, should be sufficient to supply the gas requirements each hour of the day. The storage facilities should be large enough so that the maximum loss in gas stock is not over about 75% during peak load hours, and the main should be large enough to permit the gas stock to be replaced during the night. The storage can be either low pressure holders or high pressure tanks of the cylindrical or spherical type.

In the case of low pressure holders, if the area to be supplied is intermediate or high pressure, compressors or boosters must be provided to pump out the gas.

If high pressure tanks are used, compressors must be provided to pump gas from the main into the tanks during off-peak hours. With this method of supplying the outlying area, the main, naturally, is smaller than would be the case if the area were supplied with a main only, and no storage facilities. Consequently, the average annual pressure of gas pumped into the main would be greater and the pumping cost higher. In addition, any gas used from high pressure storage tanks must be replaced by pumping it from the supply main into the tanks, thereby entailing an extra cost. The use of gas storage at outlying areas saves some investments in pumping facilities at the station where the gas is pumped into the supply main.

To use storage facilities, land must be available at a suitable location. In addition, permission must be granted by the local authorities to erect and operate the storage holder or tanks, compressors and auxiliary equipment.

Third Method

The third method of supplying gas to an outlying area is by means of an existing main and the installation of a booster and pulsation tanks.

A booster must be located where there is a sufficient supply of gas available at all times, at a pressure not below some predetermined allowable minimum, with the booster in operation. For supplying an area where the gas load is expected to increase from year to year, the use of a booster is only a temporary expedient. This is because eventually sufficient gas will not be available at the booster inlet at a suitable pressure, or the main from the booster to the area to be supplied will not have sufficient carrying capacity even with the booster operating at its maximum pressure. In addition the booster capacity will be too small unless originally it was greatly in excess of that required. These conditions must be taken into account when planning a supply to an outlying area. Also, it is necessary to consider how the area will be supplied when the booster or existing piping become inadequate. This all enters into the economic picture.

The use of a booster results in additional pumping costs. During peak load periods when the booster is in operation, there is the cost of that pumping, and during off peak periods when the booster is not in operation, higher pressures must be carried at the plant because the mains are smaller than would be the case if no booster were required and the area were supplied with mains only. There is no saving in compressor capacity at the plant due to using a booster between the plant and the outlying area to be supplied. In fact, if the load increases as a result of the use of a booster, the spare compressor capacity must be used, or additional capacity must be installed at the plant.

The three methods I have outlined so far involve no problems of interchangeability of gases.

Fourth Method

The fourth method of supplying gas to an outlying area is by means of an LP gas-air plant located in or near that area.

If this area is supplied 100% with LP gas-air at all times, there will be no problem of interchangeability. However, if a 520 Btu LP gas-air is produced, it is likely that its cost will be considerably greater than the average cost of gas of the same heating

value produced at the regular manufacturing plants of the company. Consequently, a new gas rate schedule may be required.

If an LP gas-air plant is used for peak loads, in conjunction with an existing main supplying gas to an outlying area, the problem of interchangeability arises. Only a limited proportion of LP gas-air can be mixed with the regular gas, even if the heating value is increased. For example, in our situation where we produce LP gas-air during peak load periods at our two principal production plants, we can have approximately 12 to 15% of 520 Btu gas-air in the mixture without raising the heating value above the 520 Btu standard. The maximum we can have in the mixture is approximately 30%, and with that proportion the heating value of the total mixed gas must be increased to 600 Btu or higher, by increasing the heating value of the LP gas-air to 700 or 800 Btu. If the gas from the regular production plant contains some LP gas, as is the case in our situation, then at some outlying area very little, or possibly no additional LP gas can be added.

The use of LP gas necessitates the installation of storage tanks for that gas, or liquid, as it is in storage. Provisions must be made for receiving LP gas either by tank car or tank truck. The storage capacity should be sufficient to take care of the LP gas requirements for the entire winter, unless the market is such that this material can be purchased from time to time during the winter as required.

Consideration should be given as to whether the mixture of regular gas and LP gas-air as produced is at a sufficiently high pressure for local distribution, or whether the LP gas-air, or the mixture must be repumped, with a consequent added cost.

Fifth Method

The fifth method of supplying gas to an outlying area is by means of a catalytic reforming plant located in or near that area. Such a plant, with the conditions under consideration, would probably reform LP gas, although refinery oil gas and natural gas, can also be reformed in a catalytic plant.

Using LP gas, a catalytic plant will produce a finished gas of almost any required heating value. A 520 Btu finished gas could be produced having any desired specific gravity from approximately .5 to .8 or more. Consequently, in most situations, there should be no serious problem of interchangeability with the regular gas supplied during off-peak periods.

A catalytic reforming plant produces gas at a pressure of 30 to 40 psi. Therefore, in many situations, no repumping would be required. However, the air used for mixing must be pumped to the required pressure.

Fuel must be used in a catalytic reforming plant. The same kind of LP gas used for reforming can be used for this purpose, but it is expensive. It is ordinarily more economical to use fuel oil.

The use of LP gas in a catalytic reforming plant necessitates the installation of storage tanks for the LP gas and storage tanks for the fuel oil. Provisions must be made for receiving LP gas and fuel oil either by tank car or tank truck. Again the problem arises of having sufficient storage for LP gas and fuel oil to take care of the entire winter's requirements or of having a smaller storage and being able to purchase the necessary quantities of those materials from time to time during the winter.

A catalytic reforming plant requires several hours to place in operation, unless the heats are kept up. To keep the heats up all winter would require the use of an appreciable quantity of fuel oil.

Sixth Method

The sixth method of supplying gas to an outlying area is by means of bottled gas.

This method may only apply to a newly built-up area so located that none of the previously discussed methods of supplying gas would be economically sound.

The principal reason for supplying bottled gas under these circumstances would be to start the newcomers in the area using gas, and to keep them using gas until such time as added population or greater gas sales would change the picture and make it economical to supply them with gas by one of the more conventional methods previously discussed.

Now that various possible methods of supplying gas to an outlying area are in mind, a study should be made to solve the problem at hand.

First, as previously mentioned, some of the methods can be discarded without giving them any detailed study. There may remain then two or three possible methods of supply, the method to be finally used depending on the results of the economic study.

For each method it is necessary to plan the location and layout of all new piping and equipment. This must fit into the existing system of piping and plants, and as far as possible, into the planned future of the whole gas company. In determining the new investment to be made, many factors must be taken into account, such as maximum pressure and minimum allowable pressures at various locations, present and possible future

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take-offs from mains, minimum stock of gas permitted in various holders and tanks, type of pumping units; that is, reciprocating, centrifugal or other, method of driving these units, such as electricity, gas or steam, spare equipment required to insure continuity of supply, whether pumping units will be fully automatic or otherwise, type of high pressure storage tanks to be installed, that is, cylindrical or spherical, the maximum working pressure for which such tanks are to be designed and other factors which will occur to the person making the studies.

The matter of whether to install one large main or two smaller mains must be considered. For instance, in our situation a 12 inch steel main costs approximately twice as much as an 8 inch steel main, but it will deliver about three times as much gas. However, for safety of supply, or to open additional new business territory, two mains by different routes may be advisable, even though costlier.

As for high pressure tanks, ours are all of the horizontal cylindrical type. Tanks which we use for storage of so called city gas were designed for a maximum working pressure of 75 psi, whereas tanks used for storing our LP gas were designed for a maximum working pressure of 200 psi. In a study we made several months ago, we planned installing tanks designed for a working pressure of 200 psi for storage of city gas near an outlying area. This matter has been abandoned for the present due to economic reasons.

At four of our high pressure city gas tank locations, we have electric-driven reciprocal compressors to refill the tanks during off-peak hours. Three of those installations are fully automatic.

It must be borne in mind that in a few years, after new tanks are installed, the insurance company will require that the working pressure be lowered. This lowering will continue as the tanks become older.

In connection with LP gas-air and catalytic reforming plants, it is only necessary to house certain items of equipment, consisting principally of compressors, boilers, instruments and some automatic and electrical devices.

After the investment has been estimated, it is necessary to decide upon the percent fixed charges to apply to the various items of new property. These fixed charges will consist of required return on investment, depreciation and taxes.

The fixed charges having been calculated, it is next necessary to turn to the matter of operating expenses and discuss some of the conditions which will affect such expenses.

With one method of supplying gas, the average pressure at the compressors may be greater than with some other method, thereby affecting the operating expenses. Higher average pressures in the mains usually result in higher unaccounted-for gas. A new compressor may operate at most times at only a small part of the capacity and pressure for which it was designed, with possible loss in efficiency. With one method, some of the gas will be double pumped, whereas with another method, single pumping only is required.

High pressure tank installations and booster stations must be inspected and maintained. The painting of tanks and piping in a large installation is an appreciable item of maintenance.

LP gas-air plants and catalytic reforming plants require operating and maintenance labor. It is advisable to keep attendants or operators at plants of this type at all times during the peak load season.

One man per shift is required to operate a small plant during the winter months. Then there is the problem of what to do with these men during the balance of the year. In some situations it may mean an all year expense for which no useful work will be done except for a few days during the winter.

In some situations, the loss in heating value due to compression is great enough so that it must be considered. It may be necessary to produce gas of higher than required heating value, or else enrich the gas after compression. This condition may occur at the regular compression station, or at the high pressure storage locations, or both. In our situation, a large percentage of the gas we send out consists of coke oven gas, cold enriched gas and reformed refinery oil gas, so we have no problem of heating value loss.

Conclusion

In each problem there are so many items of expense affected that it is well to consider each item of expense appearing in the P.U.C. uniform system of accounts, to be sure that no items of expense are overlooked.

A study of the estimated fixed charges and operating expenses for each proposed method of supplying gas to an outlying area will readily disclose which of the methods is the more economical.

It is not necessary to employ any one of the methods I have discussed in this paper to the exclusion of the others, when planning a supply of gas to an outlying area. In practice, a combination of two or more of these methods is often used, and it may be economically desirable to do so.

Again, there are situations where the matter of economics must be overlooked temporarily because of inability to obtain suitable equipment or pipe. Conditions prevailing today are probably forcing some gas companies to supply outlying areas by some method not as economical as would be possible if suitable materials were available.

Nevertheless, it is desirable to make an economic study of each problem, and adopt the more economical method of supply to the extent that prevailing conditions will permit.

Paper presented at Pennsylvania Gas Association, May 20-23, 1947.

Controls for Gas Production. A 16 page bulletin, No. 135, issued by Askania Regulator Company, 242 East Ontario Street, Chicago 11, will be of much interest to every gas production man.

Printed in two colors and well illustrated with photos and diagrams, it analyzes the jet-pipe principle employed in their appliances. Applications include stack draft, holder control, fuel gas control, collecting main, booster and exhauster. Copy sent on request.

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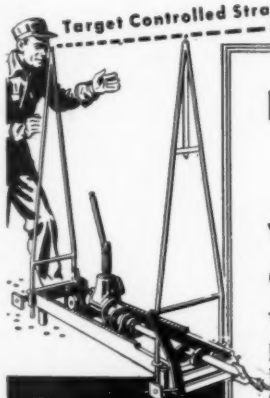

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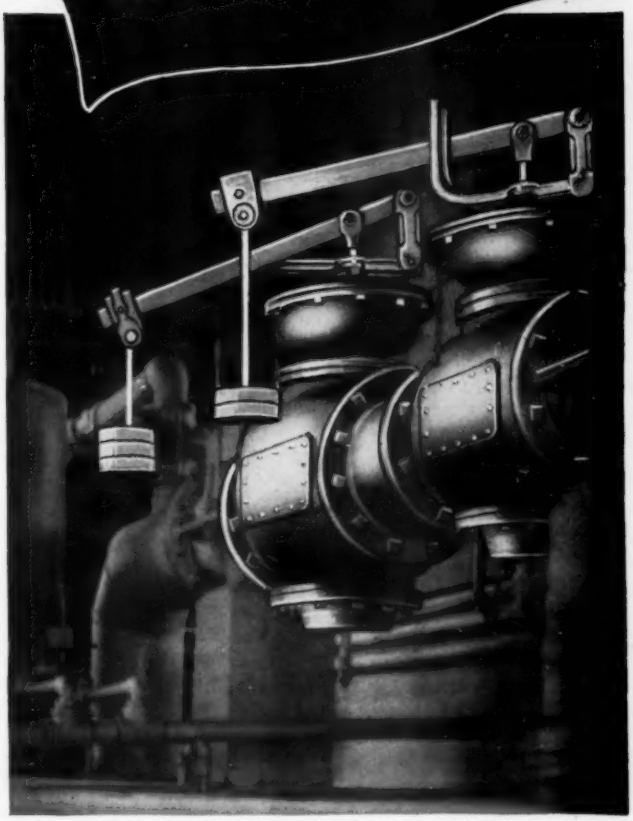

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RECENT COURT DECISIONS *Affecting Gas Utilities*

Legality of Gas Taxation

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

MODERN higher courts consistently hold that taxation is an attribute and function of sovereignty. Therefore, the foundation of the state's taxing authority is the state Constitution, which usually confers general legislative power upon the General Assembly.

Generally speaking, the power to tax is not expressly conferred upon municipalities but there are binding precedents, whereby a question as to the legal existence of taxing powers of municipalities presents no great difficulty, as was pointed out by Judge Robinson in City v. American, 147 N. E. 806.

In other words, it is regarded as settled law that a municipality may levy and collect an excise or sales tax for local purposes *only* so long as it is *not* precluded by state legislation.

Actually the power of the General Assembly or Legislature to limit or preclude taxation by municipalities would no doubt exist even in the absence of a grant or authority by the state's Constitution.

Although these points of law pertaining to taxation are generally well established, yet it seems that in some litigations, involving complicated and technical law, the Supreme Court holds opposite to all the lower courts.

For example, in Haefner v. City of Youngstown, 68 N. E. (2d) 64, reported September, 1946, it was shown that a city passed an ordinance that specified a tax of two and one-half per centum on the net rate charged for natural gas consumed in the city.

The ordinance also stated that the tax shall be added to the consumer's bill and the charges for both tax and service collected by the gas company at the same time. A further provision was that the tax levied shall not apply with respect to gas used by the state or the United States Government.

Previously the state Legislature passed a statute, known as "sales tax," which required all sellers of merchandise and commodities at retail to collect 3% tax from the purchasers, and pay this tax over to the state.

The gas company filed suit on the contention that such an ordinance is invalid in a state whose Legislature previously had enacted a state excise or sales tax law, as was so in this, and almost all other states. In this particular state (Ohio) all gas companies receipts are subject to a state excise tax of 3 per centum.

Nevertheless, the Court of Common Please held the ordinance valid, and dismissed the petition of the gas company for impounded moneys collected by the company under the ordinance.

The higher Court of Appeals affirmed the judgment and the controversy was appealed to the Supreme Court.

The Supreme Court reversed all lower courts, held the ordinance invalid and ordered the city to refund to the gas consumers all moneys previously collected by the gas company on the authority of the ordinance. This court said:

"This case involves a consideration of the relative powers of the state and its municipalities in levying excise taxes in the same general field and especially upon the receipts from utility commodities and services sold and furnished.... We can conclude only that by levying the sales tax and the gross receipts tax the General Assembly has pre-empted the field of taxation which includes receipts by utility companies from natural gas, electricity and water sold to consumers. . . . There is no disputed question of fact and, therefore as a matter of law, the collection of the excise tax sought to be imposed by the ordinance should be restrained. For the reason given the judgments of the courts below are reversed and a final judgment is entered declaring the ordinance invalid, enjoining the collection of taxes under the ordinance and ordering the impounded taxes returned to the taxpayers."

Thus, it is quite apparent that city ordinances are void which authorize collection of taxes in fields now covered by the tax laws of the state. This is double taxation.

Double Taxation Is Illegal

Taxation is an intensely practical matter, and laws in respect of it should be construed and applied with a view of avoiding, so far as possible, unjust and oppressive consequences.

If merchandise, property, or commodities are located in one state and its owner resides in another state the two states cannot legitimately tax the same merchandise, property or commodity. The Supreme Court of the United States established this law in State of Minnesota, 50 S. Ct. 99.

The facts of this case are that a corporation located in New York held negotiable bonds and certificates of indebtedness issued by the State of Minnesota and the cities of Minneapolis and St. Paul. Some of these were registered, others were payable to bearer.

The Minnesota state Court held that although the state of New York taxed the bonds and certificates yet taxes levied by the state of Minnesota on the same securities also were valid.

The United States Supreme Court reversed this decision and held:

" . . . . Nor is it permissible broadly to say that, notwithstanding the Fourteenth Amendment, two states have power to tax the same personalty on different and inconsistent principles.... We have determined that in general intangibles may be properly taxed at the domicile of their owner, and we can find no sufficient reason for saying that they are not entitled to enjoy an immunity against taxation at more than one place similar to that accorded to tangibles. . . . . Tangibles with permanent situs therein, and their testamentary transfer, may be taxed only by the state where they are found."

Interstate Taxation

Notwithstanding arguments to the contrary a state may rightfully and legally tax any property within the boundaries of the state, if the property is temporarily or permanently detained in the state.

For instance, in the leading case of People v. Bacon, 90 N. E. 686, it was shown that merchandise was shipped from one state through another state, while passing through this state it was removed from the cars by the owner for the mere temporary purpose of inspecting, weighing, cleaning, drying, and grading it. The higher court held that this merchandise was *not* actually in transit, but has a situs in this state which resulted in it being subject to taxation there. This court said:

"In construing and enforcing the interstate commerce clause of the federal constitution, the rule has been established by the United States Supreme Court that property actually in transit from one state to another is exempt from local taxation; but, if such property be stored for an indefinite time during such transit for other than natural causes or lack of facilities for immediate transportation, it may be lawfully assessed by local authorities."

Of course, the mere fact that merchandise is shipped through a state and stopped by the carrier for necessary transfer to a warehouse or other corporations does not result in the state having a legal right to subject the goods to taxation. This law is applicable to property such as pipe lines, cars and motor-trucks used by a gas company to transport its property in interstate commerce.

Also, see Union v. Utah State Tax Commission, 169 Pac. (2d) 804, reported October, 1946. Here it was shown that a utility used motor equipment in Nebraska in hauling of interstate merchandise. Subsequently it transferred this equipment to its Salt Lake City plant, where, again, it was used in handiing interstate merchandise.

The Utah State Tax Commission assessed a "use" tax of 3% upon the equipment based on their purchase price.

The higher court refused to allow Utah to tax the equipment and said:

"It is, of course, true that time elapsed between the use in Nebraska and the use in Utah; but what is the evidence of withdrawal in Nebraska from interstate activities? Merely the transfer from Nebraska to Utah — in other words, the elements of time and distance. . . . . These engines were instrumentalities in interstate commerce use in Nebraska."

Tax On Piped Gas

Considerable discussion has arisen from time to time over the legal question: May a state collect taxes on gas owned by a resident of the state and which is transported into the state?

The Supreme Court has held that such a tax law is void unless it is imposed *solely* on the tax payer's intrastate business.

For instance, in the late case of East Gas Company v. Tax commission, 51 S. Ct. 499, it was shown that a state enacted a law which required payment of taxes by every corporation engaged in the business of supplying natural gas to its citizens for light, heat or power. The law, also, provides that the amount of the taxes shall be based upon the "gross receipts" of each company located within the state.

A gas company in Ohio furnished natural gas to consumers in more than fifty municipalities in the state. It piped a part of its supply from its own wells within the state. The balance of the gas supply was obtained from wells located outside the state. The gas company utilized pipe lines to transport gas to the Ohio state line from where it was transported under high pressure to various dis-

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tributing points. From these distributing points it was passed into smaller pipe lines, and thence to consumers.

The question presented the Supreme Court of the United States was whether or not the state of Ohio could collect taxes from the gas company based on its *gross receipts* from gas transported into the state of Ohio. It is interesting to observe that this higher court held although the gas company owned the gas, the instant it crossed the state line it was liable for payment of taxes only on gas which was redistributed or transported by *more* than one movement. This court stated the following important law:

"The transportation of gas from wells outside Ohio by the lines of the producing companies to the state line and thence by means of appellant's (gas company's) high pressure transmission lines to their connection with its local systems is essentially national—not local—in character and is interstate commerce within as well as without that state. The mere fact that the title or the custody of the gas passes while it is enroute from state to state is not determinative of the question where interstate commerce ends."

Also, see United Gas Pipe Line Company v. Lee, 17 So. (2d) 553. In this case a gas company sued state authorities to prevent collection of taxes by the state on gas sold to public utilities within the state. The testimony proved that the gas was delivered into the state through pipe lines and in an uninterrupted stream from other states. The higher court held that interstate commerce was involved and the state could not collect tax on the gas, and said:

"It is our conclusion that the facts alleged bring the appellant (gas company) within the rule enunciated by the Supreme Court of the United States."

Also, see State Tax Commission v. Interstate Natural Gas Company, Inc., 284 U. S. 41; and Illinois Natural Gas Company v. Central Illinois Public Service Company, 314 U. S. 498.

Must Be Specific

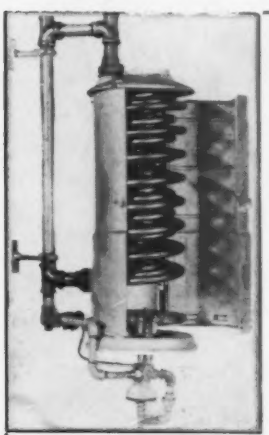
Modern higher courts consistently hold that state taxation laws, under which gas is subjected to taxation, must specifically provide for taxation.

For example, in Tamble v. Pullman Company, 207 F. 30, a court held a tax assessment in the state of Tennessee void, because the assessment was made under general laws relating to *general property* within the state. This court said:

"An examination of the assessment acts discloses no provision for the taxation of property of this character. While these acts provide generally that all property shall be assessed for taxation, the methods of assessing the tax provided in these acts are only applicable, so far as personal property is concerned, to property having an actual situs in a given country where it can be regularly assessed for taxation."

In another leading case, Southern v. Patterson, 123 S. W. 353, the court explained that while it is a general rule that all property is taxable by the legitimate acts of Legislature, the proceedings under which a state seeks to assess taxes on gas and other property are void if the state law states no definite method or plan for collection of the taxes.

Therefore, a valid law must not only specify what kind of property shall be taxed, but it must also state the *methods* for acquiring the valuation of such property, and clothe some person, officer or tribunal with power and authority to assess the valuation.



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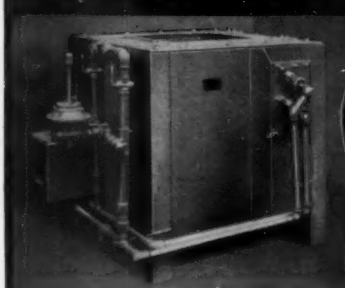

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Maintaining Gas Service While Lines Must Be Shut Down

By
Fred A. Herr

THE Southern Counties Gas Company of Los Angeles has developed an extremely practical method of maintaining gas service to consumers during periods when a transmission line must be shut down for reconditioning, renewal or testing.

Virgil Jury, utilization engineer of that firm, points out in a recent summation of the company's present procedure, that while it has been found desirable at times to shut down the entire line in order to facilitate the work and, under certain conditions, to remove the line from the ground and transport it to a distant point for reconditioning, Southern Counties has reached the conclusion that the best practical method of maintaining service to customers on such lines during the progress of the work is by supplying them with liquefied petroleum gas.

In a report on Southern Counties' procedures, Mr. Jury covers such points as planning for the conversion to auxiliary gas supply service, how the survey of the consumers' appliances is made, a list of special material required to install the tanks for bottled gas, cost estimates, tank requirement estimates and an outline of instructions for the men assigned to the appliance conversion work.

How Consumer Permission is Obtained

In planning for the conversion whereby customers can be supplied with auxiliary gas during line shut-down, Mr. Jury emphasized that to properly plan the total requirements for rendering temporary bottled gas service, Southern Counties Gas Company has found it expedient to obtain a request for service from each consumer. The utility obtains this permission and information on appliances by mailing form letters to each consumer affected by the shut-down. Three pieces of mailing matter are used. These include a letter advising the consumer of the proposed shut-down, a copy of a safety bulletin explaining the characteristics and use of bottled gas, and a postcard to be filled in by the consumer as a request for or rejection of bottled gas service.

Southern Counties Gas Company uses a letter phrased as follows to advise consumers of a pending line shut-down and the bottled gas service it offers as a temporary medium:

Dear . . .

It will be necessary to shut down our ——transmission line this summer for extensive testing and maintainance operations. Since this line is the only source from which we can supply you with natural gas, your natural gas service will be interrupted for possibly two weeks some time during June or July. We will give you notice of the exact dates as soon as our plans have been developed. We have made arrangements to provide you with temporary bottled gas service during this period, if you desire it. The only charge to you for this service will be for the gas actually consumed, which will be billed at the same rate per cubic foot as you are now paying for natural gas.

In case you may not be home because of vacations, or other reasons, during the period of interruption, we would appreciate being advised so we will not plan to provide bottled gas service.

It may be impossible to convert some appliances to bottled gas service because of our inability to get the necessary parts, or because of the nature or location of the appliance.

We call your particular attention to the enclosed bulletin concerning bottled gas service. If you wish us to provide that service, please sign and return the enclosed postal card.

Very truly yours
(signed)
Division Manager

Signed Request Obtained

The postcard which Sountern Counties Gas Company sends to customers in order to obtain their written permission or rejection of bottled gas service, reads:

..... **California.**
Date .....

I have read your bulletin concerning temporary bottled gas service and hereby request that you provide this service for me during the period when your transmission line is shut down.

I understand that the bottled gas will be charged to me at the same rate per cubic foot as natural gas and that no special service charge will be made for this service.

Name .....

Address .....

Based on the requests for service received on the postal card survey, Southern Counties Gas Company practice then calls for a call to be made on each consumer for an inspection and survey of the premises. The information obtained at each consumer's premises is recorded on a special form on which is listed such information as meter number and size, average billing for four previous months, input for range, water heater, gas refrigerator, space heaters, furnaces, boilers and other gas burning units. The number of pilots on each appliance is noted as is also the fact that an appliance can or cannot be shut off. Provision is made on the form for recording the make of pilot controls and any unusual condition or location of the appliance.

If, in the judgment of the company investigator, a certain appliance cannot be used safely with liquefied gas service, it is marked for "shut off" during the line shut-down period and the customer notified by means of another form called "Shut-Off Notice to Consumer."

On this form the company advises the consumer that conditions as noted on the form have been observed and makes specified recommendations which make it necessary to shut off that appliance because, in the opinion of the gas company, it cannot be used safely with liquefied gas service. The reasons are checked off under three headings: Location of the appliance, the unavailability of the necessary conversion parts, or specific reasons which are stated on the notice form. The company's practice is to attempt to obtain acknowledgment receipt signatures on such notices from the tenant, owner or acting agent.

A special red tag then is attached to the appliance shut off. This tag contains the information that the gas to the appliance has been left shut off for the reasons inscribed lower down on the tag. The following caution is printed on the tag:

"All responsibility for further operation of the appliance in its present condition must be assumed by the consumer."

List of Special Materials

At the conclusion of the field survey, Mr. Jury's report points out, an estimate of special materials required to install the bottled gas tanks and the special parts required to convert

the appliances, is assembled. He cited the following as samples of special materials required:

Materials required to install bottled gas tanks:

1. . . Pigtail connections.
2. . . . #214 ¾" plug valves.

Materials required to convert appliances:

1. . . Orifice adapters.
2. . . . #1 plug orifices.
3. . . . #8 plug orifices.
4. . . . #11 plug orifices.
5. . . . #79 or smaller Servel orifices.
6. . . . Single slot turbulators (Servel).
7. . . . Tips for Barber burners for use with L.P.G.
8. . . . Tips for Crane Water heater burners for use with L.P.G.
9. . . . 3/16" O.D. aluminum tubing.
10. . . . 3/16" tubing unions.
11. . . . Watrola pipe joint gum.
12. . . . ⅛" pipe plugs
13. . . . 4"x6" cloth shipping bags with drawstrings to be used to store parts removed from appliances.

Mr. Jury declared that a preliminary estimate of the cost of the conversion should include such factors as the time required to install the bottled gas tanks; time required to convert the appliance to operation on bottled gas; maintenance of the tanks for duration of the shutdown; removal of the tanks at the conclusion of the work; reconversion of the appliances to natural gas; materials required to convert the appliances; and automobile mileage of service men.

The number of tanks, according to Mr. Jury, depends upon the total load requirement of a given consumer, but it may be concluded, he stated, that the number of tanks installed will usually vary from one to five, an estimate that it based upon a decision to install the minimum number of tanks that will adequately supply the demand of the appliances connected.

He cited a typical example encountered by Southern Counties Gas Company which indicates that assistance from a bottled gas dealer can be obtained should the preliminary study indicate that an adequate supply of tanks will be difficult to obtain.

"In advance of a proposed shutdown," Mr. Jury declared, "the preliminary study indicated that an adequate supply of tanks would be difficult to obtain. A small supply of 25-gallon size was available to supply consumers located along one section of the line. The decision was made to contact local L.P.G. dealers and obtain bids on supplying tanks for the balance of the consumers.

"A dealer was contacted who was equipped to handle this work. Accordingly, the dealer and a company representative conducted a survey of the area. This survey resulted in a proposal by the dealer which included the following points:

"To supply the tanks in adequate quantity and sizes to supply all consumers. The supply to include 25, 50, 130, 250 and 500-gallon sizes. To locate the bottles at the meter installations and connect the bottles into a valve installed at the meter for this purpose. To furnish labor and materials at a flat charge to connect larger tanks which may be located some distance from company facilities. Tanks to be supplied on a rental basis including placing of the tanks in a safe location. Fill and refilling of tanks and acceptance of responsibility of providing an adequate supply of propane.

"The fill costs to be billed at the following rates:

"25-gal. size
.10 cents a gallon

50, 130 and 250 gallon
.07 cents a gallon

500 gallon
.07 a gallon for first filling
.065 a gallon for refilling.

"The fill costs to include the dealer's daily check of the 50 to 500 gallon size and refilling as required. The company to assume the responsibility of notifying the dealer when any of the 25 gallon bottles required refilling. All miscellaneous labor and material, such as installing additional piping, heat exchangers, and any similar work necessary to complete and maintain the auxiliary gas supply. And removal of the tanks upon completion of the work."

Instruction to Conversion Men

Mr. Jury reported that a review of the entire program of a proposed conversion and specific instructions for converting the appliance is reviewed with all men assigned to this work. It is Southern Counties Gas Company practice, he said, to supply each man with a preliminary outline governing the methods of appliance adjustment and precautions necessary in converting from natural gas to liquified petroleum gas.

The general information issued by the company emphasizes three major points:

1. . . Check for most suitable and alternate location for the bottled gas tanks, if other than present meter locations.

2. . . Leaks in housepiping must be isolated and repaired before service can be instigated with L.P.G.

3. . . Consumers are to be instructed that if any pilot light goes out (particularly on water heaters), the appliance must be turned off and a call made to the gas company requesting that the pilot be relighted. The consumer should be further instructed that no electric switches should be turned on or off during this time.

More specific instructions are issued by the company on various individual appliance adjustment procedures and parts of appliances.

Typical of such instructions are the following selected from Mr. Jury's report:

Top burners should be adjusted for an input of approximately 7000 B.T.U.'s. A soft adjustment should be made to obtain lengthening of the flame and yet to avoid smoking of the utensils, ad-

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justments should be made when the burners are hot.

Automatic pilots on ovens should be eliminated. The oven bypass flame should be adjusted approximately 3/8" high.

All heaters not having an operative, 100% safety pilot will be disconnected or otherwise rendered inoperative, and properly tagged.

Adjust burner flame to lower input consistant with good combustion. Water heater burners with Barber type tips should be shut off entirely.

Input to luminous flame burners should be lowered to a point where no sooting will occur.

Time of Various Jobs

Mr. Jury reported that Southern Counties Gas Company's experience with conversion to auxiliary gas supply has found the various jobs to consume time in the following order:

Testing and locating and repairing leakage.
Installing fixed orifices and adjusting water heaters.
Disconnecting appliances.
Adjusting gas engines.
Adjusting ranges.
Adjusting Servels.

Southern Counties Gas Company has found it advisable to make weekly follow-up calls to check the operation of appliances. Mr. Jury declared that such weekly reports should contain the following additional information.

Current status of the work on the pipeline.
Number of customers receiving bottled gas service.
Number of appliances disconneted.
Maximum length of time any consumer has been on bottled gas service.

"Liquefied petroleum auxiliary gas is a practical method of serving customers on a temporary basis during a pipeline shutdown," Mr. Jury stated in the conclusion of his report. "The characteristics of heavier-than-air gas should be clearly understood and imparted to all persons concerned with the changeover. No problems will be met which cannot be handled by keeping the basic characteristics of the fuel in mind."

N. Y. - N. J. Regional Gas Sales Conference

PLANS and programs that will spark the gas industry's drive to retain and enlarge the domestic gas load were presented to 200 eastern sales and advertising executives at the New York-New Jersey Regional Gas Sales Conference which took place June 23 and 24 at the Essex-Sussex Hotel, Spring Lake, New Jersey.

The business of the conference was punctuated with glowing tributes to the chairman, James P. Hanlan, gas sales manager, Public Service Electric & Gas Co., Newark, N. J. who retired July 1 after many years of sales leadership in the gas industry. It was a "repeat" performance for Mr. Hanlan who was chairman of the first New York-New Jersey conference in 1925.

W. B. Hewson publicity and advertising manager, The Brooklyn Union Gas Co., was elected chairman of the 1948 Sales Council to succeed Mr. Hanlan. Walter G. McKie, manager, domestic sales department, Rochester Gas and Electric Corp., was named vice-chairman, while James A. Sackett, Kings County Lighting Co., and Robert B. Denhardt, Central Hudson Gas and Electric Corp., were selected for the Executive Committee.

Opening a four-pronged symposium on the New Freedom Gas Kitchen Program, Walter G. McKie described the activities of the Rochester Kitchen Center where modern ventilated gas kitchens are displayed and a complete planning service offered. More than 50,000 visitors have passed through the center in the 14 months ending June 1, 1947, he reported, adding that requests for kitchen planning service are increasing.

The next speaker, Martin Gibbons, supervisor, kitchen program, The Brooklyn Union Gas Co., explained how his company has sold 175 complete gas kitchens and $180,000 worth of equipment through a cooperative plan. The company does not sell kitchens direct but supplies leads and sales aids to two cooperating firms who deal directly with the customer.

Since kitchen is a woman's domain, feminine logic is needed to help plan and promote the new Freedom Gas Kitchen idea, Evelyn Kirkpatrick, kitchen planning consultant, Boston Consolidated Gas Co., told the conference. Home service can be a most valuable asset in any kitchen promotional program, Miss Kirkpatrick pointed out, because war shortages caused increasing numbers of women to turn to home service for answers to their domestic problems.

J. P. Hanlan, Gas Sales Manager, Public Service Electric & Gas Company

W. B. Hewson, Publicity and Advertising Manager, The Brooklyn Union Gas Company

Summing up the new Freedom Gas Kitchen discussion, H. Vinton Potter, director, A.G.A.-G.A.M.A. New Freedom Gas Kitchen Bureau, said "heretofore we have sold an idea now we must merchandise it." As a potent tool for the selling phase of this program, Mr. Potter announced a Certification Program for new construction as well as for home remodeling. Under this program, kitchens which meet the four requirements of (1) scientific planning for step-saving, time-saving, work-saving convenience, (2) contain an automatic gas range built to "CP" standards, (3) a gas refrigerator, and (4) an automatic quick-recovery gas water heater, will receive a certificate from the bureau.

In an enlightening address, R. J. Canniff, advertising and sales promotion manager, Servel, Inc., traced the pattern of salesmanship in the Amer-

ican business system and concluded that this pattern needs only slight adjustment today to meet the challenge of the highly competitive postwar era. He called for the issuance of more factual material on our products through negotiated publicity, more tangible results from advertising, and more sales training to provide the necessary sales power.

Mr. Canniff expressed concern that the utilities' sales departments are only 30 per cent manned while the manufacturers are ready for mass production of appliances as soon as materials become available. Giving his own company as an example, he declared that gas refrigerator production today is in excess of the 1941 rate. "We hit a record production level of 2,000 per day recently," he said.

E. Carl Sorby, vice-president, The George D. Roper Corp., concluded the Monday morning session with an eloquent plea for the gas companies "to set your selling organization in tune with the finest cooking vehicle of modern times, the automatic 'CP' gas range." While our eyes today are on production, they will soon turn to selling, he said, illustrating his remarks with a set of moving gears which emphasized "the terrific potency of selling" and its indispensable part in a going organization.

A three-way merchandising analysis of the home laundry business and its potential effect on gas load occupied a major portion of the Tuesday program. The initial speaker was M. R. Rodger, utility sales manager, Bendix Home Appliances, Inc., who cited the tremendous opportunity for new gas sales in supplying hot water for the automatic washers and in supplying fuel for gas dryers.

M. L. Busch, Hamilton Mfg. Co., described the gas dryer. This gas unit can dry a full load in between 15 and 25 minutes, has automatic clock control, is easy to service and has 190 degree maximum heat which kills bacteria in the clothes. Its maximum input is 20,000 B.t.u.'s per hour. They must be demonstrated to be sold, Mr. Busch declared, pointing out that the New Haven Gas Light Company recently installed 25 driers on approval and none was returned.

The case for promotion of the modern gas laundry was summed up with force and clarity by the third speaker, Frank McFerran, general sales manager, The Ruud Manufacturing Company, who said this profitable load should not be allowed to go by default. Pointing out that 3½ million washers are sold each year, he said this is a large percentage of our customers and we have an obligation to provide them with adequate automatic gas water heating service.

Turning the spotlight to domestic cooking, W. B. Hewson, member of the A. G. A. National Advertising Domestic Copy Committee, described a strong new short-term advertising campaign which will break this fall in national magazines, accompanied by a coordinated drive to promote automatic gas cooking. Spearhead will be 98,000,000 advertising messages in 10 national magazines—three insertions each from late September through December.

Mr. Hewson urged local gas utilities to run at least one large newspaper ad each of the three months following closely the theme and appearance of the national ads and to stress the "new" story in radio, car cards, truck panels, direct mail, outdoor posters and other media.

Final program feature was an address by A. C. Fox, Fuller Brush Company, of Pittsburgh, entitled "There's Gold in Them Thar Doorbells." An exponent of direct door-to-door selling, Mr. Fox regaled his audience with many selling anecdotes interlarded with valuable advice on salesmanship technique.

Housewives are the greatest group of purchasing agents, Mr. Fox said, and home is an ideal setting for sales.

J. P. Hanlan Retires After Fifty-Three Years' Service

James P. Hanlan, 6 Cleveland Road, Caldwell, N. J., retired on pension July 23 after having completed more than fifty-three years with Public Service and predecessor companies. Mr. Hanlan was Sales Manager, Gas, since 1935.

Starting in the utility business in 1893 as an office boy for the Hudson County Gas Company, a predecessor company of Public Service, Mr. Hanlan worked his way up through the ranks holding such positions as cashier, head of the collection department, and agent, Hudson County District. Prior to that Mr. Hanlan worked as a lamp lighter for two years, during the hours before and after school.

During the latter part of his career with Public Service, Mr. Hanlan was Assistant to the Vice President in charge of Sales and later Assistant General Sales Manager, Gas.

Mr. Hanlan has been affiliated with the following organizations in the gas industry: president and director of the New Jersey Gas Association; chairman of the Residential Section of the American Gas Association; vice president, Eastern States Gas Conference; chairman of the New York and New Jersey Regional Sales Conference.

"Elno"
TRADE MARK REG.

RUST PREVENTER

For Automatic Water Heaters, Range Boilers, And All Types Of Hot Water Storage Tanks

"Elno" prevents rusty water in domestic and industrial water heating systems. It is a pure and simple, rust preventer. It extends the life of galvanized storage tanks, especially where corrosive water conditions exist.

"Elno" is made to fit all makes of Automatic Water Heaters, Range Boilers, and Large Volume Hot Water Storage Tanks.

"Elno" is easy to install. Remove the hot water fitting and replace it with the "Elno" rod—that's all. "Elno" is equipped with a hot water fitting.

"Elno" enables you to sell Clean, Rust-free Hot Water Service. "Elno" gives you another talking point, an added selling feature.

There is an "Elno" made to fit the water heater you sell.

Write for prices.

If you want to read the Story of Corrosion, its Causes and Prevention, write for Facts Bulletin, No. 102.

The Cleveland Heater Co.
"Elno" Division
2310 Superior Avenue
Cleveland 14, Ohio

Expansion of Peak-Load Propane-Air Gas Plant

Brooklyn N. Y. Prepares for Winter Demands by Expanding Tankage Capacity

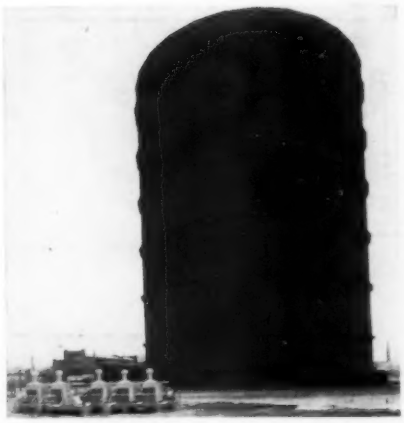
INCLUDED in the broad program of plant and increased distribution facilities being carried through by The Brooklyn Union Gas Company to meet increasing demand, is an interesting L.P. gas installation.

It is intended to provide a greatly increased capacity to meet the heavy peak load demands and so improve the house-heating situation during the winter season. The initial plant consisted of 5 *Gasair* machines with storage capacity sufficient to produce 500,000 cu. ft. per hour of 540 Btu. gas for 120 hours.

This installation is a departure from the usual plant of this type in that tank cars on barges are unloaded at the company's dock and the L.P. gas transported to widely separated points under pressure by pipe line to reach tank farm and gas machines. The distance from the dock to the tank farm is about 1400 feet and from tank farm to *Gasair* machines is some 1200 feet.

Propane and/or butane reaches the Brooklyn Union docks on Newtown Creek in tank cars carried on barges—six cars to a barge. Tank cars have capacity of 10,000 gallons under 35-150 lbs. pressure.

At the dock landing is located the compressor house for unloading the tank cars using neoprene hose connected to entrance piping and S.K. double sight glass flow indicators on each line placed between two halves on the exterior. Here the L.P. gas is repressured for delivery over pipe line to the tank farm, after tank car pressure will no longer force the liquid to the lower pressure storage tanks.



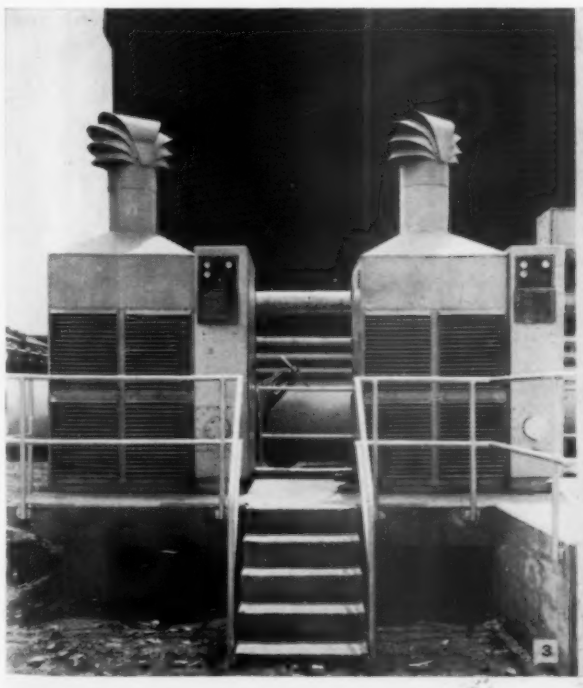
In striking contrast to the 15,000 M.C.F. gas holder are the 5 Gasair machines nearby with a capacity of 12,000 M.C.F. of 540 B.T.U. Gas per 24 hours

There are 5 compressor units with surge tanks. Each compressor has a capacity of 30 cfm. These step up pressure to 200 psi. Ventilation of the compressor house is at the floor level on account of the specific gravity of the gas.

Pipe Lines

A six inch pipe line with protective coating and carrying the liquid gas runs from compressor house to the tank farm. In addition to this there is a 4" coated manufactured gas line from the works exhauster house to the compressor house at

Fig. 3. Two of the gas machines show location of the control panels
Fig. 4. General view of 36 inch main and header
Fig. 5. Central mixing unit with 16" diameter venturi and back pressure valve



The 5 Gasair machines with 36 inch main in background, leading to the holder

e dock, part of which rallels the liquid gas ıe, and with a branch ıding to the tank farm ıere three motor driven mpressors repressure e storage tanks as the opane is withdrawn. so there is a 4" line th protective covering, carry liquid gas from e tank farm to the *ısair* machines.

At the present tank rm is a compressor use to supply pressure force the liquid pro- ne or butane to the *Gasair* machines lo- ted near the 15,000,000 cu. ft. ıterless gas holder and 100 feet ɔm the meter house. Check valves th on the line and a by-pass are used in a concrete basin near the s-air units.

nk Farms

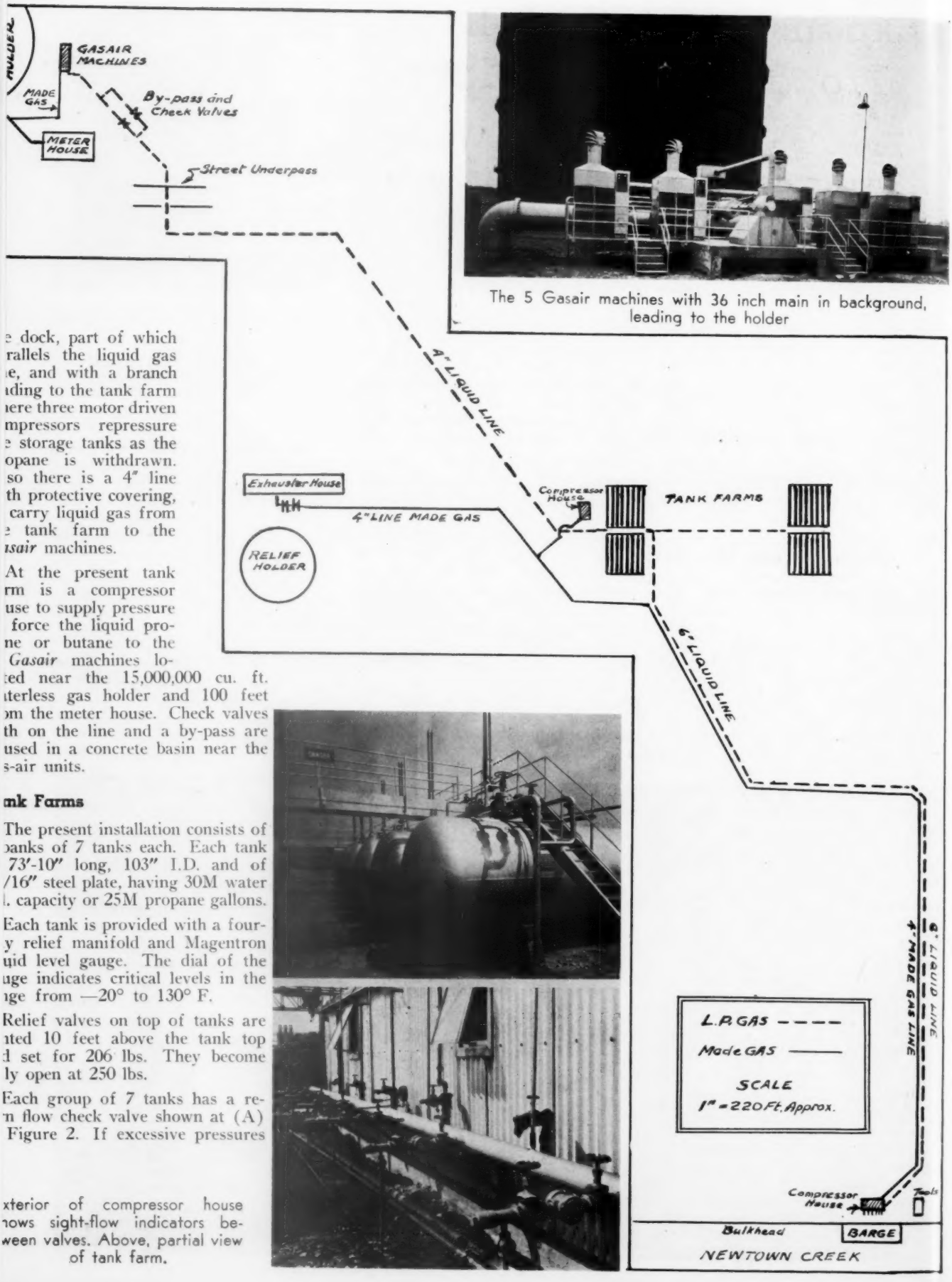
The present installation consists of ɔanks of 7 tanks each. Each tank 73'-10" long, 103" I.D. and of /16" steel plate, having 30M water . capacity or 25M propane gallons.

Each tank is provided with a four- y relief manifold and Magentron uid level gauge. The dial of the ıge indicates critical levels in the ıge from —20° to 130° F.

Relief valves on top of tanks are ıted 10 feet above the tank top d set for 206 lbs. They become ly open at 250 lbs.

Each group of 7 tanks has a re- n flow check valve shown at (A) Figure 2. If excessive pressures

xterior of compressor house ıows sight-flow indicators be- ween valves. Above, partial view of tank farm.



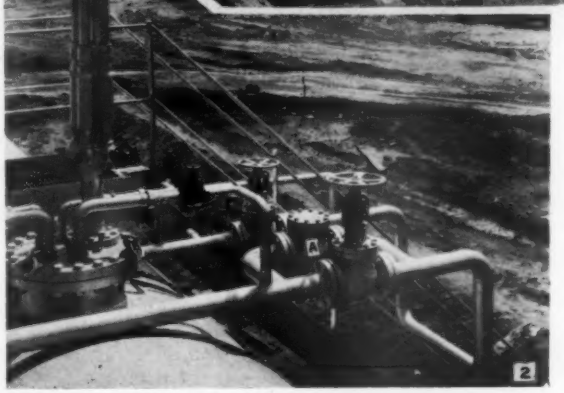


Fig. 1. Original installation of 14 storage tanks

Fig. 2. Four-way relief manifold and return flow check valve at A

generate beyond the stop valves on the lines when closed, the check valves divert the pressure back into the tanks where the safety valve manifolds relieve the pressure.

All piping and fittings are extra-heavy. Valves are rated at 400 lbs. Neoprene is used for valve packings, gaskets, regulators and diaphragms. All tanks and piping system, catwalks and railings have aluminum protective coating.

Total propane storage capacity of the 14 tanks now installed is 350 thousand gallons. This provides for a gas-air plant capacity in its present stage of 120 hours operation at a rate of 500,000 cu. ft. per hour, making 540 Btu. gas (5 days continuous operation.

Increased Storage

Construction is now in progress on an additional 14 tanks of the same capacity to provide increased storage. They are located 200 feet north of the present farm and spaced according to the N.B.F.U. ruling of 5 feet between tanks. These tanks will be installed and filled with L.P. gas before winter.

Gasair Machines

In the present installation of 5 *Gasair* machines, provision is made in the 36 inch header leading from these for an additional bank of 5 more machines. A 36″ main connects this header with the 48″ main leading to the holder.

The 5 *Gasair* machines—(VM-8) are 4′ x 6′ x 7′ high, have a capacity of 50 M.C.F. per hour of made gas for each unit. Two of these are shown with controls in Figure 3 and all are designed to operate with propane or butane.

The Central Unit (Mo-16) is a mixer only (Figure 5). It has a 16″ diameter Venturi outlet with 16″ vapor header leading from the direct fired vaporizers, mixes it with air and produces 250 M.C.F. of gas per hour. In short it produces as much gas per hour as the other five units combined.

Aluminum disc swing Norwalk valves at the outlet of each machine prevents back flow of made gas in the event the machine shuts down.

Operating Costs

Unloading of L.P. Gas from tank cars on barge, supervision of tank farms and operation of gas making units are all accomplished with a minimum number of attendants as the plant is practically automatic in operation.

Except for opening and closing valves as part of starting and stopping the units, and for tank repressuring, no additional labor is required.

Equipment is built and tested for 300 psi working pressure to comply with all safety codes and is approved by safety and regulatory commissions.

Engineered and installed by Pacific Gas Corporation.

Get the FACTS
GAS HOLDER Inspection REPORT
STACEY
THIS REPORT ...may mean much to you.
Our Standard Inspection Report tells the actual condition—inside and out—of each gas holder examined. It gives you the hidden facts on where serious corrosion trouble may be brewing in your holders. It points out misalignments — their cause and best corrective measures. In short—it will save you money on your gas holder investment. Let us give you the facts.
The STACEY MANUFACTURING Co.
SINCE 1851
CINCINNATI 16, OHIO
GAS HOLDERS • HI-PRESSURE TANKS • PURIFIER BOXES
ENGINEERS • FABRICATORS • CONSTRUCTORS
An Independent Organization Not Affiliated With Any Other Builders of Gas Holders

Natural Gas Purification at Barker Dome, New Mexico

By
Van Thompson[1]
And
R. A. Graff[2]

FOR MANY YEARS, the Southern Union Gas Company of Dallas, has produced natural gas from shallow wells located in the Barker Dome and Ute Basin Fields, San Juan County, New Mexico, and in recent years this gas supply has been somewhat limited during peak periods due to the gradual decline in rock pressure.

In 1945, the Southern Union Production Company embarked on an exploration program in this area, and since that date five large open flow natural gas wells have been completed in a limestone formation of the Pennsylvanian Age, at a depth of approximately 9000 feet, with a rock pressure of 2975 pounds.

From the extent of present discoveries, this deep gas production field promises to be one of the major gas producing areas in the west.

Unfortunately, this large gas reserve is contaminated with both hydrogen sulphide and carbon dioxide, and the approximate analysis is given below:

Methane plus	84%
Carbon Dioxide	15%
Hydrogen Sulphide	1%
Gross BTU	888
Specific Gravity	.725

In order to make the above gas marketable, and raise the BTU content, the Southern Union Gas Company decided in late 1945 to install a 25 MM SCF/day gas purification plant and this unit was subsequently placed in operation during the fall of 1946, in ample time to meet the increased winter peak requirements.

Gas Purification Plant

The gas purification plant is unique in many respects, inasmuch as from a purification standpoint, the natural gas treated is undoubtedly one of the most difficult to process, due to the high percentage of acid gas in the mixture.

Inasmuch as gas purification methods usually remove the carbon dioxide along with the hydrogen sulphide, the purification of this gas presented some interesting problems as regards to maintaining a low initial investment cost, and still obtaining a high degree of carbon dioxide and hydrogen sulphide removal from the treated gas. Inasmuch as the gas field is located at a considerable distance from the market, removal of the carbon dioxide is highly desirable both from a BTU enrichment standpoint, and from a pipe line transportation problem. The gas out of the purification plant has 1056 BTU per cubic foot, with a specific gravity of .582.

The organic amine process was selected for the purification of the natural gas, and a water solution was employed in order to obtain high capacities, without the attendant difficulties encountered when other mixtures are employed.

The gas purification plant is operated as a year-round project, and during the summer months, excess gas from the purification plant will be used to repressure the old shallow gas fields. It is estimated that seven billion cubic feet of gas can be stored in this upper zone, which will be utilized during periods of peak demand and when the gas purification plant may be shut down.

Due to the rigorous winter climatic conditions that occur in the Rocky Mountain area, special precautions must be taken in producing this gas, since hydrates form readily unless the gathering lines can be kept at proper temperatures. The pipe line heaters have minimized this problem, and several line heaters are used on the gathering system from each well. Wells are produced by flowing the gas through a pressure reducing regulator into a high pressure water and hydrocarbon separator, and then further reducing the pressure to approximately 1,000 psig, at which pressure the gas is processed for the removal of hydrogen sulphide or carbon dioxide.

Gas Dehydrated

After purification, the gas is dehydrated by means of a glycol type unit, and the dew point of the gas is depressed approximately 40°F., and is rendered safe for pipeline distribution.

The normal flow of gas through the plant is as shown on the accompanying flow diagram and it will be noted that sour gas is contacted in a bubble tray type absorber with aqueous monoethanolamine, and the rich monoethanolamine solution flows from the base of the absorber and then passes through the heat exchanger and into the amine stripper, where the rich solution descends counter-current to an ascending stream of stripping steam, and the carbon dioxide and hydrogen sulphide are almost completely stripped from the amine solution. Only a very slight trace of hydrogen sulphide remains in the stripped amine solution, and as a result of this high degree of regeneration, natural gas is obtained which will show a negative lead acetate test.

The stripping of the monethanolamine solution is accomplished by a combination of mechanical stripping of the solution with steam and also a chemical dissociation of the monoethanolamine carbonate and sulphide at elevated temperatures. The organic amines have the property of varying in alkalinity with temperature, and the pH of monoethanolamine solution at 75°F. is above 12.5 while at approximately 280° it is slightly more than 7.

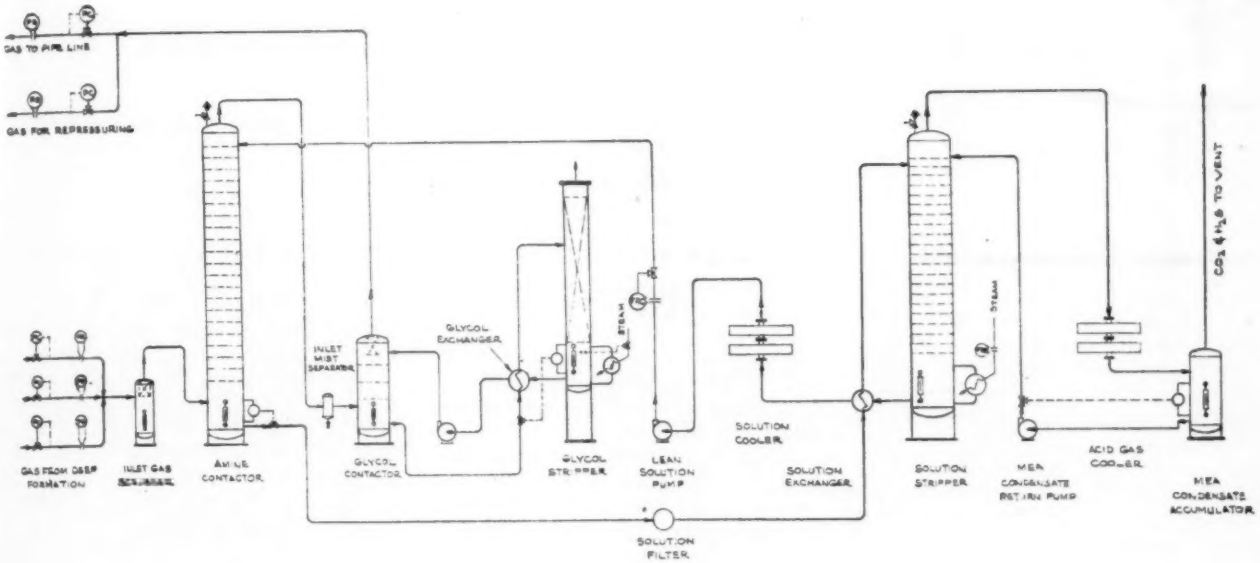
Removing Acidic Gases

As can be readily seen, this system offers an exceedingly simple method for removing acidic gases from natural gas, inasmuch as the amine acts as a reversible alkali-neutral compound, and at low temperatures has an exceedingly high affinity for hydrogen sulphide and carbon dioxide.

The stripped amine solution leaves the base of the stripper and passes through the solution exchanger, and is further cooled in atmospheric sections, located in the base of the cooling tower.

[1] *Southern Union Gas Company, Dallas, Texas*

[2] *Graff Engineering & Equipment Co., Louisville, Kentucky*



All the tubular heat exchange equipment is located on the low pressure solution side, and the cooled solution is pumped by means of a turbine driven, five stage centrifugal pump to the top of the absorber, and thus completes the cycle. Overhead steam from the solution stripper is condensed in the gas cooler, and the condensate is returned to the top of the stripper. The hydrogen sulphide and carbon dioxide gas mixture from the gas cooler passes through the condensate accumulator and is vented to the atmosphere. The gas mixture produced will not burn, and this gas is vented at a sufficient elevation as not to interfere with the safety of the personnel.

In order to remove traces of solid matter, and foreign substances that enter with the gas stream, a solution filter is interposed in the rich solution stream from the absorber, and removes any solid matter present.

Due to an existing shortage of materials, the steam generation plant was assembled from 5-150 h.p. oil field type, 350 psig working pressure boilers, and this system has since proved entirely satisfactory. The entire high pressure steam output from the steam generation plant is reduced to approximately 100 psig, by passing through the various drives which operate the solution pumping equipment and boiler feed water handling equipment, and the plant is extremely well balanced as regards high pressure and low pressure steam. All low pressure steam is used for solution regeneration purposes. Very little high pressure steam make-up is used, and practically 100% condensate returns is obtained.

Water Supply

The development of a water supply for this plant presented a major problem. Very little surface water is available in the Barker Dome Area, and the cooling tower make-up water and boiler feed make-up water is obtained from shallow wells within a radius of 5 miles from the plant site.

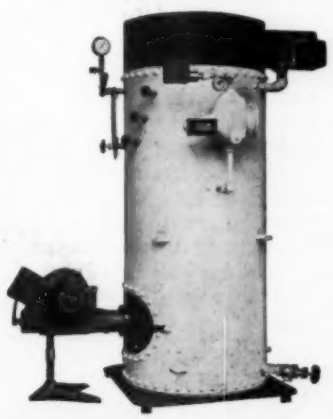
As is common with water in this general area, a high alkalinity and high percentage of solids was encountered, and a moderate percentage of blow down is required at the cooling tower in order to prevent scaling of the atmospheric sections.

A zeolite softener followed by the addition of chemicals in the boiler is presently employed. However, the supply of this particular water is limited and the cost of treatment is quite high.

It is planned to install one low pressure boiler, and chemically treated well water will be fed into this boiler and the steam generated will be introduced into the 100 psig low pressure steam system and condensed in the MEA solution reboiler and returned to the boiler feed deaerator-accumulator. A liquid level controller on the deaerator-accumulator will actuate the gas supply to this low pressure boiler. It appears that, insofar as the boiler feed water treatment and boiler maintenance is concerned, this method will be more economical.

The economics of treating this type of gas may be of interest, and preliminary figures indicate that the cost of removal of the hydrogen sulphide and the carbon dioxide will not exceed 1c per M SCF of gas, at the outlet of the plant. The major cost of this operation is labor, and 2 men per shift are normally required for the satisfactory operation of the unit. The initial plant investment was in the neighborhood of $350,000.00, and the purchasing and erection of this plant was carried out as a project within the Southern Union Gas Company organization. The installation was designed and engineered by the Graff Engineering and Equipment Company of Louisville, Kentucky, and the plant is presently being operated under the direct supervision of Mr. N. P. Chesnutt, with headquarters at La Plata, New Mexico.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular fur nace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

Heat Losses in Furnace Linings

By
J. D. McCullough
Manager, Engineering & Service Dept.
Refractories Division
The Babcock & Wilcox Co., New York

PART 2

Combustion Considerations

It is not the purpose of this discussion to illustrate the manner of determining a complete heat balance, nor to explain combustion processes. For purposes of clarity, though, a few points should be mentioned.

In making a complete heat balance, we should take into account all of the heat which goes into the furnace lining (walls, arch, hearth, doors), heat conducted through metal extending into the furnace, heat absorbed by the ware, heat radiated through openings, etc., and heat which is lost up the stack as sensible heat in products of combustion including excess air, moisture, and incomplete combustion.

For a given exit gas temperature and fuel we are faced with a minimum sensible heat loss. Assume a natural gas fired with 10% excess air leaving a furnace at 1800 F for which we find the total amount of heat going up the stack to be 52%. This means that only 100 — 52 = 48% of all fuel burned in the furnace is available for work, whether for heating the ware, heating the lining, or flowing through the walls. Thus, if we require 48 Btu for the lining, we must introduce 100 Btu into the furnace. Therefore, after we determine the number of Btu absorbed by the walls, we must divide that quantity by the fraction of available heat to determine the required heat input to the furnace to satisfy the wall requirements.

All data presented in this discussion will be on a sq ft basis. To determine total furnace requirements, the total mean area of each portion of the furnace; i.e., walls, arch, hearth, doors, etc., should be measured, and the areas multiplied by the factors applying to the various sections, with due regard to different wall thicknesses and constructions in each area.

With the background thus far covered, we are in a position to determine heat losses on furnaces operating under several different cycles.

Continuously Fired Furnace

Let us first consider a furnace which is operating 24 hours a day for seven days a week for months on end. This would be typical of some continuous baking ovens, tunnel kilns, and oil stills.

In such a furnace, the heat flow is our principal loss, and the heat storage is of secondary importance because of the infrequency of shutdowns. Therefore, low thermal conductivity is a determining influence in the selection of a lining.

Assume that a unit operates 50 weeks out of the year with two shutdowns a year of one week each. In this case in computing the heat flow, we ignore the relatively small period of unsteady state and multiply the hourly steady-state flow by the total hours of operation. Table II has been prepared to summarize the results on such a furnace operating at 1800 F.

It is apparent that if standard firebrick must be used, it should be well insulated. If the economics were carried out to the end point, additional insulation over that shown would be justified. However, we trust that the example indicates how the problem may be set up to arrive at an optimum balance point for sound economic considerations.

In the example it was assumed that the hot-face temperature remained constant for the entire operating period. In practice there would be periodic variations from the average temperature. When the temperature does vary from that desired, the use of IFB normally permits a faster return to desired operating temperature than can be obtained with heavy firebrick. For this reason lightweight refractories are frequently used on

TABLE II

ECONOMIC STUDY OF ANNUAL HEAT LOSS BY WALLS FROM CONTINUOUSLY OPERATED FURNACE @ 1800 F
50-WEEKS OPERATION PER YEAR-TWO SHUTDOWNS

1	2	3	4	5	6	7	8	9	10	11
CONSTRUCTION	HEAT FLOW BTU/SQ FT	HEAT STORAGE BTU/SQ FT	TOTAL INPUT TO WALL MILLIONS OF BTU/SQ FT	TOTAL INPUT TO FURNACE BTU/SQ FT	FUEL COST PER SQFT @ 40¢ PER MILLION BTU	SAVING IN FUEL COST OVER 9"FB PER SQ FT	INSTALLED COST PER SQ FT	INCREASED INSTALLED COST OVER 9" FB PER SQ FT	NET SAVING OVER 9" FB AT END OF FIRST YR PER SQ FT	ANNUAL SAVINGS AFTER FULL DEPRECIATION PER SQ FT
9" FB	11,046,000	50,600	11.097	23.12	$9.25		$2.43			
9" FB+4½" IFB "A"	2,444,400	85,420	2.530	5.27	2.11	$7.14	3.78	$1.35	$5.78	$7.14
9" IFB "A"	1,612,800	8,560	1.621	3.377	1.35	7.90	2.69	.26	7.63	7.90
9" IFB "B"	2,620,800	12,960	2.634	5.488	2.20	7.05	2.69	.25	6.78	7.03

Col. 2 – Annual Heat Flow (Btu/sq ft-hr x 8400 hr) = Btu/sq ft
8400 hr = 50 weeks x 7 days x 24 hr

Col. 3 – Heat Storage:– Storage at Steady State x 2 (No. Shutdowns per year) = Btu/sq ft

Col. 4 – (Col. 2 + Col. 3) ÷ 1,000,000

Col. 5 – Input to Wall (Col. 4) ÷ Available Heat (Assumed as 0.48)

Col. 8 – FB – $75.00/M Delivered
10.00/M For Mortar
105.00/M For Labor

IFB – $115.00/M Delivered
10.00/M For Mortar
85.00/M For Labor

12.8 Brick/sq ft – In 9" Wall
6.4 Brick/sq ft – In 4-1/2" Wall

Col. 10 – Col. 7 minus Col. 9 based on one year write-off of extra cost

Col. 11 – Same as Col. 7

Fuel – Natural Gas 1,000 Btu/cu ft @ 40¢/thousand cu ft

the hot face even though an economic balance may show little fuel savings advantage.

Furnace Shut Down Weekly

There are a large group of furnaces operating three shifts a day with week-end shutdowns. Such furnaces will reach the steady state, and heat-flow losses play an important part. During the shutdown period, they will also lose a portion of their heat storage which must be replaced on starting up. The amount of loss depends upon the type and thickness of lining and how tightly the furnace is closed. It is becoming increasingly common practice in some plants to fire the furnaces periodically over the shutdown period to prevent them from becoming too cold.

The exact determination of losses is complicated by variation in plant practices. A tightly closed furnace will lose less heat than one with dampers and doors open. Both Mawhinney[5] and Trinks[1] have offered solutions based on field results and theoretical studies.

The following method is presented as offering a means of obtaining a solution which permits the effect of weight of refractories to be taken into account. A number of Schmidt diagrams were prepared for a weekly cycle with natural cooling over the week-end assuming a closed furnace. From the data thus obtained, various multiplication factors were determined which can be applied to the hourly heat flow and to the heat storage. Table III lists these factors with an explanatory formula. It will be noted that a 47 hour week-end shutdown was assumed, but the factors may safely be used for a furnace which varies from this period by several hours either way.

As an example assume a wall of IFB "B" (2.5 lb/9″ straight) in a furnace operating steadily at 2200 F for 121 hours a week. From Table I the heat flow is 416 Btu/sq ft/hr and the heat storage is 8230 Btu/sq ft. The available heat of the gas will be assumed as 38%. Then the heat input to the furnace per week

$$= \frac{416 \times 0.96 \times 121 + 8230 \times 0.76}{0.38}$$

$$= \frac{48280 + 6225}{0.38}$$

$$= 143{,}500 \text{ Btu/sq ft}$$

In a similar manner, 9″ of firebrick would be found to require a weekly heat input of 581,500 Btu/sq ft.

For composite walls of two types of insulating firebrick, the same factors can be used without serious error. For firebrick backed up with insulation, the factors should be reduced, depending on wall thickness and amount of insulation.

TABLE III

HEAT-FLOW AND HEAT-STORAGE FACTORS
3 SHIFTS PER DAY WITH WEEK-END SHUTDOWN

WALL THICKNESS INCHES	HEAT-FLOW FACTORS	HEAT-STORAGE FACTORS
4.5	0.98	0.97
9.0	0.96	0.76
13.5	0.93	0.58
18.0	0.93	0.48

Factors are approximate for furnaces shut-down 47 hours per week, tightly closed.

Heat input to furnace per sq ft of wall = [(steady-state heat flow x heat-flow factor x hr firing) + (steady-state heat storage x heat-storage factor)] + fraction available heat

TABLE IV

HEAT INPUT-BTU/SQ FT FOR VARIOUS REFRACTORIES
COLD START-ONE-SHIFT OPERATION INCLUDING HEATING-UP TIME AND NOON HOUR

	4½" WALL			9" WALL			13½" WALL		
OPERATING TEMP - F	1600	2000	2300	1600	2000	2300	1600	2000	2300
FB - 8.0 lb	30,800	40,900	48,800	27,700	36,000	42,500	27,000	34,900	41,200
IFB - 3.0 lb	9,400	12,900	15,800	8,600	11,400	13,600	8,600	11,300	13,400
IFB - 2.5 lb	7,000	9,500	11,500	6,600	8,700	10,400	7,000	9,200	11,000
IFB - 1.5 lb	4,500	6,100	7,300	4,000	5,700	6,800	4,200	5,500	6,600

TABLE V

HEAT INPUT-BTU/SQ FT FOR VARIOUS REFRACTORIES
AVERAGE OF 5-DAY WEEK FOR ONE-SHIFT OPERATION
INCLUDING HEATING-UP TIME AND NOON HOUR

	4½" WALL			9" WALL			13½" WALL		
OPERATING TEMP - F	1600	2000	2300	1600	2000	2300	1600	2000	2300
FB - 8.0 lb	28,700	38,200	45,700	20,700	27,000	32,100	16,400	21,400	25,300
IFB - 3.0 lb	8,800	12,100	14,900	6,200	8,400	10,200	5,000	6,700	8,000
IFB - 2.5 lb	6,500	8,800	10,700	4,700	6,300	7,500	3,900	5,200	6,300
IFB - 1.5 lb	4,100	5,700	6,900	2,900	4,100	4,900	2,400	3,200	3,800

Intermittently Operated Furnaces

Perhaps the majority of furnaces in which we are interested are either fired only once or twice a week, or one shift a day for five days a week. This would be representative of most heat-treating, forge, and pot furnaces. Depending on the manner of operation and wall thickness, they may never reach the steady state. They have a long period to lose heat each night and consequently heat storage is of extreme importance.

For furnaces operating from a cold start Table IV has been prepared to give the total input to refractories for one 8-hour shift plus heat-up times and noon hour. This table is based on the assumption that the shutdown period between lightups is sufficient to lose all residual heat. In preparing the table, a difference in heating-up time was taken into account between standard firebrick and insulating firebrick of various weights. The tabulated values should be divided by the fraction of available heat to determine the total required heat input to the furnace for the furnace lining.

For furnaces operated five days a week, it has been found that the amount of heat input each day will vary slightly. This is because on the first day the principal loss is due to heat storage which must be replaced after the week-end shutdown. The second day there is more residual heat left in the furnace and less is required for storage but a greater percentage is required for heat flow. Depending on wall thicknesses, a condition of steady daily input is not achieved until the fourth or fifth day. Therefore Table V is presented, giving the average daily heat losses for various walls at different temperatures. Again a difference in heating-up time was assumed for the firebrick and insulating firebrick. Also, it is necessary to divide the tabulated values by the fraction of available heat to obtain the required total input to the furnace for the lining losses.

Both Table IV and V were prepared from Schmidt diagrams. They assume a furnace closed during shutdowns, which is not always the case in plant practice, and for this reason may give lower losses than actually result. However, they do provide a quick means of determining comparative losses of various materials and wall thicknesses. Thus they permit a quick evaluation to be made in arriving at an economic thickness of the best material for the job. The tables were based on the refractories whose thermal conductivities are shown in Fig. 1. (Part 1) A variation from those conductivities will have a slight effect on the fuel consumption, but, as the table shows, the principal consideration is weight and heat storage.

Conclusion

The study of losses in furnace linings is still in the stage of an art rather than a science. During the past fifteen years, substantial strides have been made in reducing guess work and in providing useful tools for the furnace engineer to work with. However, it cannot be overemphasized that good judgment and experience in the use of these tools are essential to obtaining the best results.

Utility Building Design Conference

REPRESENTING a broadening of the scope of the association's technical section activity, a Building Design, Construction and Maintenance Conference of the Pacific Coast Gas Association was held at Los Angeles April 16 and 17.

This new function of the West Coast group was suggested by the needed expansion in facilities for both office and operating buildings. Since the problems in this field are common to all utilities in many respects, it was decided also to invite representatives of electric power and telephone companies.

William G. Barks, Jr., office engineer, Southern Counties Gas Co., Los Angeles, presided at the two-day conference, which was held in the auditorium of the Southern California Gas Co.

The discussion on April 16 was devoted to the functional design and construction of utility buildings.

Chairman Barks opened the first session with a discussion of methods for determining space requirements in buildings and forecasting future space requirements.

He displayed tabulated figures of space meters in different districts which had been prepared to determine future growth of buildings. The span covered by the tables showed the anticipated space that would be required to serve a certain number of meters.

In detailing the Southern California Gas Company's experience in planning for the new El Monte branch building, Mr. Barks declared that from tables based on meter totals previously prepared, it was determined that the El Monte area would require a building sized to handle approximately 85,000 meters, although there were only 45,000 meters in service at the time the original survey was made. Factors that were given advance consideration were whether or not present warehouses and garages were large enough to accommodate future needs, and how much space would be needed for the accounting sections, new business division, construction operations, rest rooms, canteens, etc.

It was found, Mr. Barks explained, that while the company could not—due to restriction on building materials—erect a building based on a future meter count of 85,000, it could build a structure to allow for a volume of 60,000 meters, to which a subsequent addition could be made with reasonable economy. The smaller building therefore was erected but the plans interrelated to future requirements to a degree that when the addition is erected, it can be tied in with the already completed one with a minimum of cost and no major changes in plans.

Design provisions that allow for future alterations were also discussed at this session. A general discussion arose on how buildings can be erected in the form of mere "shells" without interior columns in order to permit expansion and enlargement without major changes in basic plans. This elicited the opinion from several present that 10 per cent of the average utility building's area is comprised of non-useful space, such as wall and hallway areas.

Master plans prepared by the Southern California Gas Company for use in altering and enlarging existing buildings and in new construction work, were exhibited by Chairman Barks.

On the subject of showers in business office buildings, the consensus of views expressed was that few utilities have them and few employees use them. On showers for plant operators the experiences of a San Diego and an Arizona utility were typical. The Arizona utility provides showers for plant operators, but they are seldom used. The San Diego Gas & Electric Co. installed showers in both plant and main office buildings where meter readers, surveyors and similar classifications of workmen have access to them, but the showers see infrequent use.

Stressed at this session was the proper location of canteens with relation to the distance the greatest number of employees must travel to reach them. A representative of one of the largest West Coast utilities declared that locating its canteen on the 12th floor instead of the 5th or 6th floor, results in a loss of approximately 2,000 minutes, or 33½ hours, per day by 1000 employees who make an average of two trips per day to the 12th floor canteen —on company time. If the canteen were more centrally located, he asserted, each of the 1000 employees could make the trips in two minutes less time.

E. E. Ellis of the Southern California Gas Co. served as discussion leader on the subject of "Functional Layout vs. Standard Layouts in Arrangements."

Mr. Ellis declared that the trend definitely is away from standard building design.

"Utilities now are thinking along lines of functional design, a trend which is apparent not only in utility circles but in other industries as well," Mr. Ellis said. "More and more the utilities are becoming functional-minded and by-passing general designs. Future consideration of utility structures must be along functional channels."

Mr. Ellis cautioned against giving an architect a blanket assignment and leaving the entire design of a proposed building to him.

"There must be company supervision over the design or you will wind up with a standard design for your building," he said. "Irrespective of how competent an architect may be, he would not possess the intimate knowledge of the needs of a utility building as would the company's own executives. He would not know the relationship of one department as well as they, nor the inter-relationship of one division of service to another general division, which would dictate the location of groups of office workers in close proximity to one another for more economic and efficient operation."

Gas Fired Home Dryer. Bulletin on this unit, issued by Bendix Home Appliances, Inc., South Bend, Ind., points out its load building possibilities and gives a complete description. The heater calls for 19 thousand Btu per hour and burns natural, mixed or manufactured gas. Copies with provision for gas company imprint are available.

How To Put Out An Employee Handbook

By

David Markstein

New Orleans, La.

Plagued by high turnover during the war, and by a consequent difficulty in orienting employees to its policies and the privileges, prerogatives and responsibilities of working for it, a gas utility in a medium sized southern city tried a gimmick that is standard practice with some manufacturers and a few stores—the personnel director prepared and distributed an employee handbook outlining general facts about utility service and a lot of particular facts about the company. The handbook proved such a success that a few months ago it was revised to fit the post-war picture and re-issued.

This personnel director found that by making his book interesting, the employees read it. That spared him repetitious indoctrination of a constantly turning over of new employees and even cut down the high wartime turnover slightly, thus reducing the overhead.

"The cost of putting out the employees handbook wasn't small," he reports, "but every cent we spent was well spent because it made possible a much greater saving in time, effort and expense of handling inexperienced personnel.

"Our labor turnover was cut down somewhat and the employees were made just a little prouder (if the word may be excused) to be working for us. And the expensive process of constantly teaching basic gas service facts, as well as the policies of the company, was made less expensive because we were able to give indoctrination to each new employee in a package—the employee handbook."

What exactly, is an employee handbook, and how may the average gas utility adapt it with results something like those of the southern utility that cut down both operating cost and labor turnover?

Employee Manual

An employee manual is a training, indoctrination, and selling device. Its functions are to sell the employee on the desirability of working for the particular company and on its employee benefits if any; teach him gas service facts and acquaint him with the firm's policies; and act as a reference book where the answers to most daily problems may be found.

An employee manual, or handbook as it is sometimes more accurately called, may be anything from a pretentious printed job to a mimeographed sheet. Naturally, the more thorough the job and the better it is produced, the more it will accomplish. Where a mimeographed form might be read once, then crumpled and thrown away, a handsome brochure is likely to be kept—and referred to as problems and questions crop up. The southern company that reported such success with wartime and postwar handbooks put out a relatively expensive printed manual, but found that it was worth every cent expended on it.

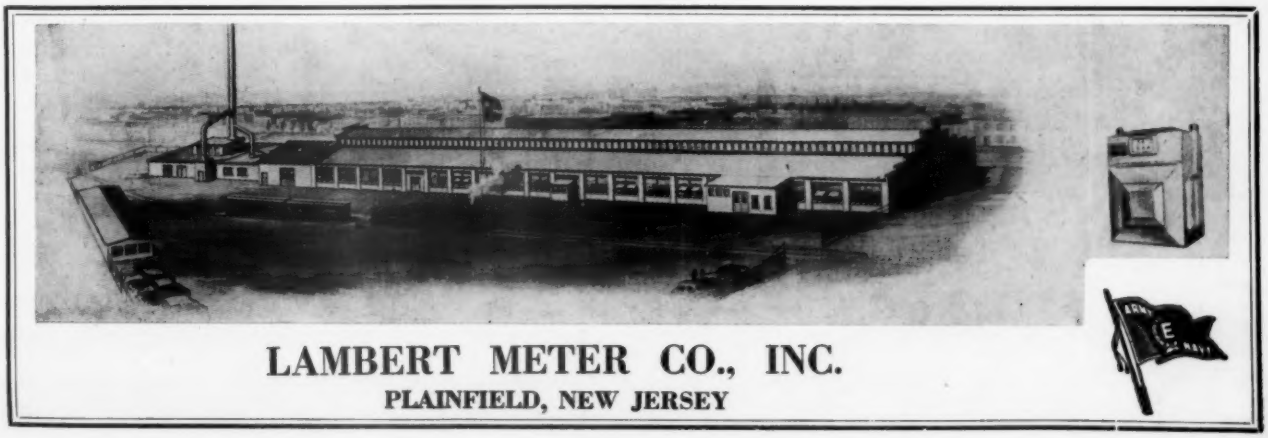
What Should a Manual Contain?

Most utilities that have issued employee handbooks agree that certain things are essential. These are: a friendly greeting and explanation of the book's purpose; something about the company's background; about gas itself, the company's policies; the benefits available to workers, if any (such as insurance, hospitalization, income tax aid, etc.), wages (and commissions); regulations; and avenues, if any, that are open for registering complaints. More or less optional departments include an employee health chapter; good housekeeping tips; minor employee policies such as time off for afternoon and morning coffee, etc.

The standard practice among utilities who have had successful experience with employee handbooks is to open with a "greeting" signed by the president. This greeting should explain the purpose of the book, and point out why it is to be kept and how it is to be used for future reference. The tone should be a friendly one and, wherever possible, the book's use should be explained in terms of how the employee himself will benefit.

The company's history, background and position in the community is important, since one of the purposes of an employee manual is to make the employee proud of the company for which he works. This sort of pride cannot be generated, however, by mere boasting or even by pointing out actual facts in a boasting tone. The chapter, page or paragraph on company background should merely present the favorable facts and leave the conclusions to be drawn from them to the employee's own intelligence.

A clear presentation of the firm's policies is important for two reasons.



It tells the new worker—and even the older one—exactly where he stands in an overall operational pattern, and it does so in black and white. It serves as a future reference text.

Both sales and employment policies should be presented. Under employee relations policies should be listed all worker benefits made available by the utility, with the advantages to be had from these benefits, and a listing of how to take advantage of them. A frank presentation of the money question is an integral part of the employee manual. The base wages, commissions, premiums, and chances for monetary advancement come under this heading.

The temptation to brag, or to deviate just a little from the absolute truth of the company's wage set-up is great—especially when it comes to a discussion of advancement opportunities. It should be put aside.

The listing of do's, don'ts and other company regulations is a ticklish matter. Not many young men liked the discipline of the Army and Navy, or there would be no need to think of a draft today. The thing they disliked—tight discipline—they are not likely to like better in a civilian job. Regulations are necessary and they often act for the good of the individual employee. So he should be told this. Every "don't" should be accompanied with a "why" to counteract, as far as possible, the natural reaction to being ordered about.

Along wth a list of regulations should be included the means by which an employee who has legitimate reason to be dissatisfied with any part of his set-up may register his complaint. This is an important part of the employee handbook.

In preparing the actual working of the manual it is imperative that a dry, gobbledygook, legalistic style be avoided, and that the copy be made readable. Observe the off-time reading habits of workers: the books, magazines and newspapers they take with them to read on the way home. Without exception, these are popular, best-seller publications written for wide appeal. In newspapers, the comic and sports pages are the most popular. So if the employee manual is to achieve a readership at least comparable to that of the employees' offtime reading, it must be written in the same easy-to-see, enjoyable style.

The comic pages that have such avid readership offer a wonderful technique for the utility that chooses to drive a handbook's points and pointers home with cartoon-style line drawings. *Life, Look* and the other picture magazines suggest another effective style: photographs.

Should photos be decided upon, it is wise to see that each has action. People will look at people in a picture more often than, for example, at an installation. If a rule is to be illustrated, an employee might be shown doing it the right way.

How should the handbook be distributed? One effective way is to present them personally at a special meeting of all hands, together with an explanation of the purposes and uses of the book.

The books can be mailed (at book rate) to the employee's home. Or they can be distributed with regular pay checks. However the distribution is done, there should be some word of personal explanation in advance from a department manager if not from the president himself.

Bendix Appoints Roberts Advertising Director

The appointment of Stewart Roberts as director of advertising and sales promotion for Bendix Home Appliances, Inc., is announced by Judson S. Sayre, president.

DETROIT'S "FIRST"
IN CONVENIENCE · COMFORT · QUALITY
In the heart of the downtown, office, theater, and shopping area. Friendly, courteous service to make your stay in Detroit a pleasant memory. The Tuller Coffee Shop or Cafeteria for excellent Food modestly priced. The Hotel Tuller, Detroit's largest, is the place to stay.
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ONE OF DETROIT'S FINEST
800 ROOMS WITH BATH FROM $2.75
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Just the burner for present day conversion. You can handle any job, domestic or commercial, with Little Gem. Easy to install. Minimum service required. Gives complete combustion without premixing.
MULTIPLE UNIT BURNER may be hooked up in series to fit any type circulating heater, steam tables, enameling ovens, galvanizing tanks and many other applications. Write for circular. Address Department 10.
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"The Denver Plan"

As a part of a new policy of utility company operation recently instituted by Mr. G. B. Buck, Vice President and General Commercial Manager of the Public Service Company of Colorado, known colloquially as "The Denver Plan," a Kitchen Planning Bureau—designated locally as "Home Planning"—is now in operation. An Architects' and Builders' Division of the Dealers' and Builders' Department coordinates the promotional and sales efforts of the Public Service Company of Colorado with the activities of the architects and building contractors, and serves them in many ways. At the same time, this Division assists all customers, builders and architects referred to it, in the planning of kitchens and homes. By placing this responsibility with the personnel charged with the duty of serving the architects, objections from architects that the Company is competing with them in their profession are avoided and their good will and cooperation retained.

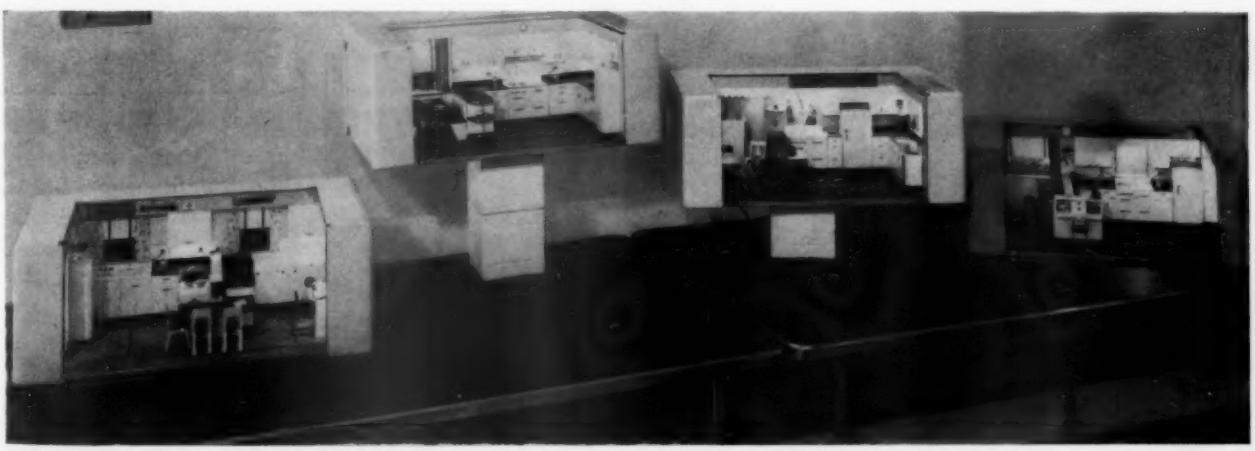
An important assistance to this Kitchen and Home Planning service is the Hospitality House, wherein a highly competent staff of Home Service specialists promotes the idea of the New Freedom Gas Kitchen through daily demonstrations, lectures, broadcasting and mailing of literature to customers. Sound slides and sound movies are used to drive home the various points, and in addition to suggestions as to kitchen planning, much information is given stressing the economy of gas as a fuel for all purposes in the home. Special sessions are planned and put on for adult consumer groups and home and kitchen planning study classes from the various colleges and universities.

Andrew A. Roebke, Supervisor of Architects' and Builders' Representatives

In the Hospitality House, customers view a model New Freedom Gas Kitchen in actual demonstration and use.

On the Sales Floor, miniature kitchens are displayed and explained to customers visiting the office for any purpose, including the paying of bills and other routine business.

From the sales floor those sufficiently interested are referred to the Architects' and Builders' Division of the Dealers' and Builders' Department located on an upper floor of the building. At this office detailed suggestions are offered and arrangements are made to visit either the homes to be modernized, or the offices of the architects or building contractors who are to be employed. In the case of an old home to be remodeled and where an architect is not to be employed, a Home Planning man visits the home, inspects it carefully, and makes notes as to dimensions, locations and other necessary information. In the case of a new home, the Home Planning man visits the architect or builder to be engaged, and tenders his services and suggestions.



Display models featuring New Freedom Gas Kitchen on sales floor of Public Service Company of Colorado

Manufacturers Light & Ht. Co. Announces Appointments

Forbes W. Burdette has been appointed manager of The Manufacturers Light and Heat Co. distribution district No. 5 and will make his headquarters at 119 Millbridge St., Pittsburgh.

In announcing this appointment, Irving K. Peck, vice president and general manager said that Mr. Burdette was taking over the responsibilities formerly assigned to George A. Walther, and from which Mr. Walther requested relief because of ill health.

Mr. Walther, manager of this district for the past 11 years, has been assigned special duties in the company's distribution department.

The new district manager joined the Manufacturers Light and Heat Co. in 1927 as an industrial engineer and for a number of years he has been local manager for the gas company at New Castle and Ellwood City.

To replace Mr. Burdette in New Castle, Mr. Peck has announced the transfer of Thomas J. Foley, as local manager at Beaver Falls, New Brighton and Rochester, Pa.

To fill the vacant post of local manager for the gas company at Beaver Falls, New Brighton and Rochester, announcement has been made of the promotion of Oren O. Todd to that position.

I Went to School

(Comments by one who attended the Industrial Gas School at Columbus, Ohio the week of May 5)

"When my boss told me that I was to attend the American Gas Association Industrial Gas School I was both pleased and scared. Although I had been with the gas company for some years, it was only after my return from war service that I was assigned to the industrial department as a cadet gas engineer. I knew there was plenty for me to learn about industrial gas, but never thought its application covered such a wide range of business, each with its own problems of utilization. The course of study bewildered me, but as the classes progressed, I gradually absorbed the subjects as they were presented so ably by a score or more of top-notch instructors.

"Combustion principles, application of combustion equipment were slightly familiar to me, but the theories of heat transfer, heat losses, and methods of heat recovery took on a new meaning when they were explained, and together with copies of the lectures and the data sheets appended to them, I'm sure I can do a more intelligent selling job to the prospects and customers in my territory.

"I was most impressed by the comradeship of gas men. Total strangers, oldsters with years of experience in this industrial gas business literally took me by the hand and explained those points that I was all confused on. Between lectures, during the recesses and after school, these old-timers went out of their way to help me gain the necessary knowledge that with my own self-help, will make a gas engineer out of me. I might have stumbled along for years picking up a little knowledge here and there, and by doing things the hard way."

Industrial Gas School

The above account summarizes The Industrial Gas School sponsored by the American Gas Association which was held at the Hotel Seneca, Columbia, Ohio, the week of May 5, 1947. This school and The Commercial Gas School which followed it in Washington filled a long felt need in the gas industry. The comprehensive course of study offered not only a broad basis of fundamentals for the cadet gas engineer, but brought the old timers up-to-date on new techniques and new applications of industrial gas.

All praise should be given to J. C. Dorsey, The East Ohio Gas Company, Cleveland, and his committee who developed this all-inclusive course of study, and secured the outstanding lecturer to present the many subjects.

Gas men from twenty-seven states, the District of Columbia, and Canada made up the nearly one-hundred and fifty who attended. The ballroom of the Seneca Hotel was the classroom. Small individual tables were provided for each student which gave each enough room to spread out the lecture material and to make notes during the progress of the lectures. In addition to the platform presentation of a subject, nearly every lecturer supplemented his talk with lantern slides which materially assisted the students in their understanding. Time after time the blackboard was used by an instructor to emphasize a point the better.

For relaxation, and to provide a change of pace for the students, they were A.G.A.'s guests at a get-together dinner held on the evening of the fourth day. This dinner was unique in the annals of the gas industry in that not a speech was made. Musical entertainment was supplied but the gas men entertained themselves by group singing. That this had a rejuvenating effect was evidenced by the alertness of all the students during the last morning sessions and the way they attacked the formal examination Friday afternoon. Contrary to expectations, the examination provoked much favorable comment and might well be the highlight of the course. With working out the answers, and the bound file of lectures, the attending students have a handbook on industrial gas that will serve them well in their daily work.

Commercial Gas School

With official greetings from Marcy L. Sperry, President of the Washington Gas Light Company, The Commercial Gas School got underway in that company's auditorium in our nation's capital on May 12, 1947 for a week's training on commercial gas. Nearly one hundred commercial men from gas companies, equipment dealers, manufacturers, and the liquid petroleum industry, representing twenty-one states, the District of Columbia, Canada, Cuba and Brazil met in the gas air conditioned auditorium of the Washington Gas Light Company for most of the sessions, and on two afternoons and one evening at the Lewis Hotel Training School located at 23rd Street and Pennsylvania Avenue.

The course of study developed by Roy E. Wright, Negea Service Corporation, Cambridge, Mass., covered every phase of the food service industry. Practically every piece of gas equipment utilized in the preparation, cooking and serving food in volume was covered in detail. The planning of kitchens, lay-outs, and modernization was gone into in great detail by experts in their respective fields. Competitive fuels and how to compute their respective costs was one of the most interesting presentations as well as the many phases of selling which included market analyses and surveys.

The highlight of the school was a cooking demonstration at the Lewis Hotel Training School by Alfred Haeringer, a former chef and Washington restaurant owner. He prepared a "dinner," and during the time of preparation he kept up a running talk describing his activities. On completion he had: four roasted chickens, one with stuffing inside, and dressing prepared separately for the other three, creamed spinach, cream of spinach soup, whipped and duchess potatoes and a minute steak with its special sauce. The proper method of preparation was described in detail together with the various uses of the gas equipment for different foods. The demonstration closed with the feeding of the multitude—true—each only had a taste and the proof of the pudding was in the eating.

A good fellowship get-together dinner was held at the Hotel Burlington on the fourth evening for all those attending the school, and on the following day, after the morning session, an examination was held.

Jahn Joins A.G.A. Staff

The American Gas Association has employed a trained gas utilization engineer to provide technical assistance to manufacturers in an effort to improve their equipment. Particular attention will be directed toward counter-type commercial cooking appliances.

Edgar A. Jahn, who joined the Association recently, is now available to assist appliance manufacturers to comply with American Standard Approval Requirements where they exist and guide them in producing efficient and safe equipment where no standards have been set up. His work is expected to be mainly with the smaller manufacturers who do not employ competent research and development engineers.

Member companies of the Association have been invited to submit names of gas appliance manufacturers who may be in need of such technical consultation and assistance.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

New Equipment and Appliances

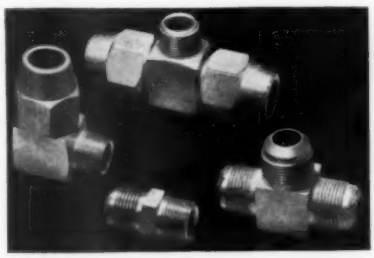
Swing Check Valves

Pokorney Manufacturing Company, 3117 Clybourn Ave., Chicago, offers a new line of super sensitive Swing Check valves, known as the "3000" series. The manufacturer states that these valves offer the advantages of sensitivity to low flow, full flow through the valve with minimum resistance.

Available in both screwed and flanged types, bronze and gray iron, I.P.S. sizes of ½ to 6". Valves are especially adapted for use with mfgd., natural or L. P. gases. Bulletin No. 3001 available on request to the manufacturer.

Heavy Duty Fittings

A new line of commercial tube fittings has been designed for heavy duty service and long life by the Flodar Corporation, 331 Frankfort Ave., Cleveland, Ohio.



The manufacturer claims these fittings to be 21% heavier and stronger than fittings of similar size. They are of special value on heavy duty or high pressure applications. Made of steel and finished in cadmium plate, Flodar fittings are manufactured in sizes from ¼" to 1½" and are available in straight—union—elbow—side tee—tube tee and cross, both male and female.

Hamilton Clothes Dryer

Hamilton Automatic Clothes Dryers operate on manufactured, natural, mixed, and bottled gas. The clothes are placed in a slowly revolving perforated drum. Baffles in the drum very gently carry the clothes to the top of the drum from which point they float downward through a pool of warm, clean, moving air, which is thermostatically controlled.

The Timer Switch on the upper panel performs four functions. It turns on the electric motor and fan, puts the drum into motion, governs the length of time the gas burner will operate, and permits the drum to revolve for five minutes after the large burner is shut off. The purpose of the five minute run with the large burner shut off is twofold: (1) it cools the clothes; (2) the clothes may be left in the Dryer and removed at the operator's convenience.

Cabinet Design Dryer

The heat is generated by a gas burner equipped with a thermostat, magnetic valve, safety pilot control, and a pilot burner which remains lit during the use of the Dryer.

The motor drives the drum, and by means of a fan it circulates the air through the air intake and exhaust chambers and ducts which are located below the drum. The moisture laden air is directed outward through the exhaust duct and a removable lint catcher located at the right in the base of the Dryer. The air intake opening is at the left of the lint catcher. Made by Hamilton Mfg. Co., Two Rivers, Wis.

Ka-Mo Earth Boring Tool

The Ka-Mo Earth Boring Tool is manufactured by Ka-Mo Tools, Inc., 2121 S. Troy St., Chicago, Ill. This tool operates through new patentable features that completely differentiate it from the conventional auger type.

This tool is unique in that it planes the earth and cannot bury itself. This results in great savings in the electric or pneumatic power necessary for operation. Transportation is simple and inexpensive, since the tool may be conveyed, with all supplementary equipment, in either a small truck or just an ordinary passenger car.

The tool is suitable for both vertical and horizontal drilling. Sizes range from 4" to 17". It is of particular benefit in drilling from house to mains under paved streets, going under railroads and operating in other spots where the surface digging of trenches is inconvenient and time-consuming.

The patented features of the Ka-Mo Tool make possible new and revolutionary applications. After more than five years of tests and applications it is already in use all over the United States and in foreign countries. Ka-Mo Tools, Inc., distributes through their dealers.

Ka-Mo Boring Tool

News of the Gas Industry

Brooklyn Union Granted Increase in Rates

The Public Service Commission announced July 24th that it has granted the Brooklyn Union Gas Company a temporary increase in gas rates to enable the utility to meet higher operating costs in wages, materials and taxes.

On a percentage basis, the increases range from 3 to about 6.4 per cent for residential service and up to 8 to 9 per cent in the general and industrial classifications. The new rates are for a period to July 1, 1948, or until otherwise ordered by the Commission, pending conclusion of the rate proceeding now in progress.

In the residential classification, the monthly minimum charge, which is now $1 with an allowance of 600 cubic feet of gas in the minimum, is increased to $1.03. In the consumption block between 600 cubic feet and 3,000 cubic feet per month the rate is increased by one-half cent per 100 cubic feet, from 9½ to 10 cents.

The next block of 3,000 cubic feet (between 3,000 and 6,000) is increased from 7 to 7½ cents per 100 cubic feet. For the next 4,000 cubic feet (between 6,000 and 10,000) is increased by one-half cent, from 6 to 6½ cents per 100 cubic feet, but for consumption over 10,000 cubic feet the increase is from 5 to 6 cents per 100 cubic feet, an increase of one cent.

If a customer uses gas for house heating and other appliances and his use runs up to say 12,000 cubic feet per month, his monthly bill will be increased by 50 cents for consumption up to 10,000 cubic feet and 10 cents on each 1,000 cubic feet in excess of 10,000.

For industrial users of gas where the customers agree in advance to use not less than 100,000 cubic feet per month, the minimum charge is increased from $100 to $105 for the first 100,000 cubic feet and thereafter up to 1,000,000 cubic feet, it is increased by one-half cent per 100 cubic feet.

The company has 800,000 customers in Brooklyn and Queens.

Shanley Asst. Secy. Accounting Section

Thomas J. Shanley has been appointed assistant secretary of the Accounting Section of the American Gas Association, effective June 1 and will serve under Walter E. Caine, present secretary of the Section.

Mr. Shanley joined the American Gas Association as a statistical clerk, July 9, 1934. Since that time he has served as assistant statistician, chief statistician, and supervisor of statistical research prior to entry into military service in 1943.

Bridgeton (N. J.) Gas Co. Completes 90 Years of Service

The annual meeting of the stockholders of The Bridgeton Gas Light Company was held July 10th at the office of the company, Bridgeton, N. J.

The Bridgeton Gas Light Company was incorporated in 1857 under a special act of the Legislature, and it is the only utility now operating in the State of New Jersey under such a charter.

The Company was formed by a group of civic minded residents who wanted to avail themselves of the conveniences of that new thing (called gas) and it is significant that the company was in operation and giving service to a limited number of customers before the City of Bridgeton itself was incorporated, that date being 1864. "At that time it included all that part of Cumberland County, then known as the Townships of Bridgeton and Cohansey."

Jacob B. Jones, Treasurer, The Bridgeton Gas Light Company

The purpose of the company in its organization was to furnish gas service rather than to operate for profit, and that principle has been the guiding thought throughout the entire 90 years of its existence.

The company is still owned and operated almost entirely by Bridgeton people, and much of its stock remains in the families of the men who first subscribed to the undertaking, although naturally some of the descendants are located in various parts of the country.

The company during its entire existence has only had three superintendents, which is unique in gas history. The first superintendent was Uriah D. Woodruff, who was an executive of the Cumberland Nail and Pipe Co. in Bridgeton, who took on the extra duties of the gas company to get it started.

He was followed by Benjamin F. Harding. Mr. Jones joined the company at the age of 16, after graduating from Bridgeton High School and Peirce Business College, as an assistant to Mr. Harding. At that time there were only five men employed on the entire plant.

On August 1st, 1948, Mr. Jones will have been with the company fifty years, which probably will make him the oldest operating man in point of service in the state.

The company is rightfully proud of its record of 90 years of continuous and uninterrupted service to the public during which time it has passed through the Civil War, the succeeding wars, the several financial depressions, and the physical difficulties that have sometimes contributed hardships to its operation.

The following directors were elected: LeRoy W. Loder, William C. Mulford, J. Herbert Fithian, Charles W. Scull, and Jacob B. Jones.

The directors later organized by electing the same officers who served the past year.

CONVENTION CALENDAR

July

7-8 *Michigan Gas Ass'n,* Grand Hotel, Mackinac Island, Michigan.

August

25-27 *Appalachian Gas Measurement Short Course,* West Virginia University, Morgantown.

September

15-17 *National Butane-Propane Assn.* Annual Convention, Jefferson Hotel, St. Louis.

19 *Oklahoma Utilities Assn.,* Biltmore Hotel, Okla. City.

23-25 *Pacific Coast Gas Association,* Hotel Del Coronado, San Diego, Cal.

23 *New Jersey Gas Association,* Stacy-Trent Hotel, Trenton.

29-30 *Independent Petroleum Assn.* Annual Meeting, Oklahoma City.

October

6-8 *American Gas Association, Annual Convention,* Cleveland, Ohio.

20-24 *National Metal Congress,* Amphitheater, Chicago.

November

10-14 *National Hotel Exposition,* Grand Central Palace, New York, A.G.A. Exhibit.

A. G. A. Activities

A.G.A. Nominations for 1947-48

General and sectional nominating committees of the American Gas Association have announced their selections for officers for the 1947-1948 Association year, subject to election at the annual convention in October.

Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, has been nominated for president. Other selections include Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs, for first vice-president; Hugh H. Cuthrell, vice-president, The Brooklyn Union Gas Co., for second vice-president; and Edward F. Barrett, president, Long Island Lighting Co., for re-election as treasurer.

Slated for new directors for a two-year term are: Walter C. Beckjord, Cincinnati; Edward G. Boyer, Philadelphia; Henry R. Cook, Baltimore; Earl H. Eacker, Boston; Joseph N. Greene, Birmingham; D. A. Hulcy, Dallas; F. A. Lydecker, Newark; James S. Moulton, San Francisco; Edward P. Noppel, New York; John A. Robertshaw, Youngwood; W. H. Rudolph, Newark; Louis B. Schiesz, Indianapolis; Edward J. Tucker, Toronto; Harry K. Wrench, Minneapolis; and C. H. Zachry, Dallas.

Other nominations are as follows: Laboratories' Managing Committee—A. F. Bridge, Los Angeles, chairman, and C. E. Bennett, Pittsburgh, vice-chairman; Accounting Section—John A. Williams, Syracuse, chairman, and L. E. Reynolds, Hartford, vice-chairman; Industrial and Commercial Gas Section—Leon Ourusoff, Washington, chairman, and Bernard T. Franck, Milwaukee, vice-chairman; Manufacturers' Section—D. B. Stokes, Burlington, chairman; Publicity and Advertising Committee—R. G. Barnett, Portland, chairman; Residential Gas Section—C. S. Stackpole, Baltimore, chairman, and W. M. Jacobs, Los Angeles, vice-chairman; Technical Section—A. C. Cherry, Cincinnati, chairman, and S. J. Modzikowski, Chicago, vice-chairman.

A.G.A. Personnel Committee Sponsors Employee Relations Conference

The American Gas Association Personnel Committee at a meeting held at the Netherland Plaza Hotel, Cincinnati, Ohio, on July 16, unanimously agreed to sponsor with the A.G.A. Southwest and Midwest Personnel Conferences, an employee relations conference for the gas industry at the Adolphus Hotel, Dallas, Texas, November 19 and 20, 1947. A program for the conference is being arranged under the supervision of the Chairmen of the three groups: Fred R. Rauch of the Cincinnati Gas & Electric Company; W. H. Senyard of the Louisiana Power & Light Company and D. L. Sedgwick of The Kansas Power & Light Company.

The A.G.A. Personnel Committee has been assigned by the Association's Executive Committee the function of acting as a clearing house for all employee training activities of the Association. A subcommittee was appointed on Employee Training consisting of L. A. Brandt, The Peoples Gas Light & Coke Company, Chairman; G. W. Fewkes, Philadelphia Electric Company and J. E. Heyke, Jr., Brooklyn Union Gas Company. It is believed that arrangement will avoid duplication of effort and assure a more effective over-all program.

A profitable discussion on the use of psychological tests was ably headed by C. E. Jurgensen, Minneapolis Gas Light Company. While the discussion recognized the limitations in the use of tests for the selection of employees, some exceptionally fine results were reported in companies where such tests are being properly applied.

Meeting A.G.A. Personnel Committee, Cincinnati, July 16, 1947

Seated left to right: J. E. Heyke, Jr., The Brooklyn Union Gas Company; L. A. Brandt of The Peoples Gas Light and Coke Company; C. B. Boulet of Wisconsin Public Service Corporation; L. M. Ayers, The Peoples Natural Gas Company; Fred R. Rauch, Chairman, of The Cincinnati Gas and Electric Company; Kurwin R. Boyes, American Gas Association; W. H. Senyard, Louisiana Power and Light Company; J. P. Flemming, Ebasco Services, Inc.; H. S. Richmond, Consumers Power Company and C. E. Jurgensen, Minneapolis Gas Light Company. Standing left to right: W. L. Haight, Wisconsin Gas & Electric Company; E. J. Brill, Pennsylvania Power & Light Company; A. J. Haswell, Oklahoma Gas and Electric Company; G. W. Fewkes, Philadelphia Electric Company; C. D. Magruder, Washington Gas Light Company and E. G. Huck, The Cincinnati Gas and Electric Company.

"Winning Seals of Approval"

"Winning Seals of Approval," and instructive and entertaining motion picture in sound-color produced by the American Gas Association's Testing Laboratories, was exhibited to an appreciative group on the evening of July 14 in the Walton Room of the Drake Hotel, Chicago.

Those present for the Chicago premier of the picture included members of the gas industry and representatives of the trade press, as well as women's magazines of general circulation.

When all were assembled introductory remarks were made by Jean Clarke Thompson and Cliff Hall, of the staff of A.G.A. The movie had a duration of only twenty minutes, but was packed with visual facts showing how laboratory technicians of the A.G.A. pull apart and put together gas ranges to make sure that the customer gets a range which is safe, durable, clean-and-cool operating. The picture demonstrates how complete mouth-watering oven, broiler and top-of-the-range meals are cooked, to point out the flexibility of modern gas ranges.

"Winning Seals of Approval" convinced those present that the modern gas range is the only answer to faultless cooking performance.

With the end of the picture a buffet supper and cocktails were served.

A.G.A. Certification Program

The American Gas Association has announced the "Certification Program" in connection with the New Freedom Gas Kitchen promotion.

For kitchens, new or remodeled, where national and local requirements have been met, an engraved Certificate will be issued to the customer . . . by name and street number. This Certificate will appeal to the customer's pride of ownership, and flatter his sense of values. It will serve the builder as an endorsement of the quality he has put into his kitchen, at the same time implying that he has used similar good judgment and quality throughout the house.

This plan provides the gas company the basis for immediate consultation with architects, builders, jobbers, dealers, and manufacturers' representatives — all of whom have a stake in the Certification Plan. When a builder agrees to install a New Freedom Gas Kitchen, all possible help should be given; and on its completion, a designated member of the organization should file a request in approved form for issuance of a Certificate. This Certificate, suitably engraved, will be issued by the New Freedom Gas Kitchen Bureau in the name of the builder or owner and with the specific street address.

Philadelphia Electric Co. Wins Advertising Award

For the fourth time in five consecutive years, the Philadelphia Electric Company, in competition with the Nation's public utilities, won the National Award for its public relations newspaper advertising, it was announced today.

In addition, Philadelphia Electric won an Honorable Mention for its annual report to stockholders, and another Honorable Mention for a printed booklet distributed during the past year.

The competitions were sponsored by the Public Utilities Advertising Association, a department of the Advertising Federation of America.

The appointment of Vincent P. McDevitt as general counsel in charge of the Legal Department of the Philadelphia Electric Company, succeeding the late Bernard P. Carey, was announced July 28th by Horace P. Liversidge, chairman of the board. The appointment becomes effective September 1.

David Gordon Company

David Gordon & Co., Inc., Chemical, Mechanical and Industrial Engineers, 29 Broadway, New York City, announce the election of Mr. Gordon, previously with the M. W. Kellogg Co., the Inter-Chemical Corp., and the Consolidated Edison Co. of N. Y., Inc., to the Presidency of the company as of July 16th. The company is actively engaged in handling both domestic and foreign business, specializing in fuels.

Tapecoat Announces Appointments

The Tapecoat Company, Evanston, Illinois, announces the appointment of James E. Mavor, 514 M & M Building, Houston 2, Texas, and Gene McIntyre, 727 West 7th Street, Los Angeles 14, Calif, to represent Tapecoat pipe joint protection material.

According to the announcement, Mr. Mavor will handle distribution of Tapecoat in the mid-continent field through his own representatives, F. P. Kelly, covering Louisiana and East Texas, and Bob Lingle at Corpus Christi. Mr. McIntyre will cover California, Washington, Oregon, Nevada and Arizona.

Gang, President Ludlow Valve Mfg. Co.

Oliver F. Gang was elected president, director and general manager of the Ludlow Valve Manufacturing Company, Inc., succeeding Alfred W. Thompson, who becomes chairman of the executive committee and continues as treasurer of the company. Announcement of the changes was made by Livingston W. Houston, chairman of the board, following a meeting of the directors on July 1.

Mr. Gang comes to the Ludlow company from the William Powell Company of Cincinnati and New York, manufacturers of valves, from which organization he resigned on June 30 as vice president and consulting engineer.

A. O. Smith Establishes Product Service Division

Announcement of a new Product Service division, which will give 24-hour off-the-shelf service to its customers in all parts of the United States, was announced July 8th by the A. O. Smith Corporation of Milwaukee, Wisconsin.

"The new division will give a complete, fast, low-cost service to distributors and dealers," said L. B. Smith, Vice-President and Assistant General Manager. "It will bring our factories right down to the local level so far as our customers are concerned and will give as direct service as if we were in a dealer's home town. The division was created to cut through all red tape and render the quickest and lowest cost service possible."

The division's first unit is in operation now in Newark, New Jersey. Headquarters of the division have been established at 8312 South Chicago Avenue, Chicago, Illinois. A third unit will go into operation soon in Los Angeles, California. The manager of the division is John J. Bohmrich. He will have his offices in Chicago.

Waste Disposal Unit. A folder issued by Valley Welding & Boiler Co., Bay City, Mich., describes the Calcinator, a gas fired automatic disposal unit for the home. May be placed in kitchen, utility room or basement. Has sealed white enamel cabinet with automatic controls. Bulletin on request.

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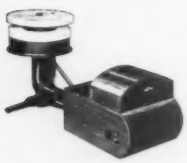

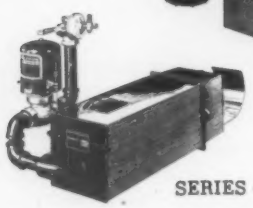

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Annual Meeting of Institute of Gas Engineers, England

The 84th Annual General Meeting of The Institution of Gas Engineers, was held in Birmingham from 3rd to 6th June, 1947, and was attended by over 1200 gas engineers and visitors, under the Presidency of Mr. George C. Pearson, O.B.E., Chief Engineer of the City of Birmingham Gas Department. The meeting was attended by official delegates from the Gas Associations of Belgium, Czechoslovakia, Denmark, France, Holland, Norway and Switzerland, as well as by official representatives of Dominion and Allied Governments and of the Control Commission in the British Zone of Germany.

Mr. Pearson, in his address said: "The abnormal weather of the past winter created an industrial crisis which the Gas Industry weathered with great credit and was enabled to enhance its reputation for reliable service to all its consumers. In Birmingham, the weather in January, February and March has gone down in history as the worst since records have been kept, and the gas output reached the phenomenal figure of 575 mill. cu. ft. in a single week, or 52 mill. cu. ft. greater than the previous weekly record. There is little doubt that the reasons for these increases are activities in trade and the limited quantities of coal and coke available for industrial and domestic purposes, coupled with higher earnings of the workers. In spite of the present, and we hope temporary, restrictions placed on the use of gas we must expect increases to persist.

"All this is really in the best interests of the country, as it is much better for coal to be processed at Gas Works than to be burned raw in homes and factories. The Gas Industry should be prepared for an appreciation of this economy and a continuance of the present upward trend of outputs, and should lay itself out to process a larger proportion of the nation's coal. To do this we must make good as speedily as possible any present shortages of plant, and plan boldly for the future; in the meantime we do not ask that industry generally should suffer, on our account, the inconvenience of staggered hours, nor face restrictions of supply for years to come. I am convinced the Gas Industry will continue to meet its commitments during the course of any necessary extension to Gas Works plant which may be called for."

The new President of the Institute is Dr. Harold Hartley, technical director of Radiation Limited, who is the first President to be elected from the utilization side of the Gas Industry.

Pacific Gas & Electric Co. Makes Changes in Executive Personnel

July brought important changes in the executive personnel of the P. G. and E.

The new appointments are:

Executive vice president, A. Emory Wishon.

Vice president and general manager, William G. B. Euler.

Vice president and chief engineer, I. C. Steele.

Vice president and executive engineer, James S. Moulton.

Vice president in charge of public relations and sales, Norman R. Sutherland.

Vice president in charge of operation, Dunlap D. Smalley.

City Gas From Wood Scrap

British Columbia Research Council has investigated the manufacture of city gas from wood scrap and the B. C. Electric Co. provided $2500 for the initial phase of the research program. Successful utilization of sawmill scrap as a source of gas would not only supplement increasingly scarce supplies of coal suitable for gas making, but would also provide a profitable use for the over 3,000 cubic yards of mill scrap which cannot be used for lumber or domestic fuel and which is now burned as waste.

Gas can be produced from wood by several methods; the wood may be heated until it breaks down into gas and charcoal; the charcoal may be partially burned to carbon monoxide with air, or steam may be passed through red hot charcoal to form carbon monoxide and hydrogen. All three processes may be combined and some experiments with the use of wood for gas have already been carried out by the B. C. Electric Co.

Gasoline Plant Explosion Hazards Reduced

Explosion hazards of mixtures of air and isobutane—a commercially important raw material used in the production of aviation gasoline—have been successfully eliminated through introduction of certain inert gases, according to a new Bureau of Mines report describing the results of a study at the Central Experiment Station, Pittsburgh, Pa.

Citing a practical application of the tests, either nitrogen or carbon dioxide may be used to render the atmosphere inside an isobutane storage tank free of explosion dangers when making repairs involving welding, the report points out.

Produced from natural gas and petroleum vapors, isobutane is combustible and generally stored in a liquid state. Bureau tests to determine ignition and explosion hazards of isobutane proved that when 39.9 percent of nitrogen or 26 percent of carbon dioxide was added to an isobutane-air mixture, the mixture became noninflammable.

A table showing the amount of inert gas needed to render other combustible-air mixtures noninflammable also is included in the publication. In most cases, this may be accomplished by adding at least 35 percent of carbon dioxide or 47.5 percent of nitrogen to the combustible gas-air mixture, the report states.

Physical and chemical properties of isobutane, limits of inflammability in air, minimum ignition temperatures, and the prevention of isobutane-air explosions by oxygen control are other topics covered in the publication. Containing several charts and detailed technical data, the report was prepared by G. W. Jones and G. S. Scott, Bureau chemists with the Gaseous Explosions Section, Explosives Division, Central Experiment Station, Pittsburgh, Pa.

A copy of Report of Investigations 4095, "Extinction of Isobutane Flames by Carbon Dioxide and Nitrogen," may be obtained free from the Bureau of Mines, Department of the Interior, Washington 25, D. C.

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Natural Gas Stored in Liquid Form

A new method for storing natural gas in liquid form which will reduce storage space by more than 99.8% has been developed by L. F. Stutzman, assistant professor of chemical engineering, and George H. Brown, instructor, at Northwestern University's Technological Institute. Under the method 800 cubic feet of natural gas may be contained in one cubic foot of storage space.

The development will have far-reaching effects on the conservation of gas from oil fields in the United States, will help save the country's natural resources and will insure a high quality of natural gas for cooking and heating in households during periods when the drain on local facilities is great.

The Northwestern University scientists reduced the temperature of natural gas to 260° below zero Fahrenheit by bringing it into contact with liquid nitrogen at a temperature of 320° below zero during a seven-month study on a huge research project which revealed that the gas could be stored economically in liquid form.

Through the use of refrigeration equipment and insulated tanks Prof. Stutzman and Brown were able to show that large storage tanks can be eliminated or used for additional storage so that a community will have an adequate supply of gas on hand at all times. The liquid gas may be returned to its gaseous state by reducing refrigeration and piping the gas off a storage tank and into gas mains.

The liquefaction permits the use and storage of natural gas from oil fields where until the present the gas has been burned off as it was piped out of the earth because of the danger of explosion and the harmful effect on workers and vegetation in oil-producing communities. Commercial enterprises long have sought a way of using natural gas which is present above almost all oil fields. It is now possible to conserve millions of cubic feet of gas which may be used in households and industry where previously it was dissipated by burning.

Valuable gases contained in natural gas may now be liquefied and diverted to industrial use in important synthetic industries because the method permits separation of ethane, methane, butane and propane after distillation.

Ethane, the most important of the gases found in natural gas, is used in the preparation of synthetic ethyl alcohol and other organic compounds. Propane is employed in the making of dyes, alcohol and explosives, methane in the preparation of dyes and butane is valuable as a base compound in the manufacture of synthetic rubber.

Graphical Symbols for Fittings and Valves

Rapidesign, Inc., is offering a flow template for gas, oil, water and chemical pipe and plumbing layouts. Cut outs cover all the symbols as shown in the American Standards Manual Z32.2.

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Direct inquiries to Mr. Charles Baron, Rapidesign, Inc., P. O. Box 592, Glendale, California.

W. W. Stevens Joins Lawson Mfg. Co. as Sales Manager

William W. Stevens, formerly eastern regional manager of appliance sales for Rheem Manufacturing Company has joined the Lawson Manufacturing Company of Pittsburgh, Pa., as general sales manager. The Lawson firm manufactures water heating and home heating appliances.

A native of Philadelphia, he joined Rheem in 1940. During the war he was chief expeditor for the company.

1948 Natural Gas Spring Meeting

The Time and Place Committee of the Natural Gas Department of the American Gas Association, under the chairmanship of C. E. Bennett has fixed the 1948 Spring Meeting at Houston, Texas, on May 4 and 5, with the Rice Hotel as headquarters.

Silex Company Elects C. H. Newman, V. P.

At a meeting of the Board of Directors of The Silex Company, Hartford, Conn., held July 8, Charles H. Newman, vice-president, was elected a director of the company effective as of that date.

Mr. Newman has been associated with The Silex Company since 1937 and also serves as an officer and director of The Silex Company Ltd., of Canada, and The Hartford Products Corporation, Chicago, Illinois, a subsidiary of The Silex Company.

BERNARD P. CAREY

Bernard P. Carey, former vice-president general counsel of the Philadelphia Electric Company, Phila., Pa., died July 7th after a long illness. He was 53.

Mr. Carey, entered the employ of the Electric Company in 1913. A few years later he was transferred to the Legal Department. In 1924, he was named attorney for the Company, and counsel in 1928. He continued in that position until 1939, when he was appointed general counsel. In 1943, he was elected vice-president of the Company.

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Book Reviews

Air Conditioning and Elements of Refrigeration, First Edition, by Samuel P. Brown, B.S., P.E., 640pp., 6 x 9, cloth cover. Published by McGraw-Hill Book Company, 330 W. 42nd Street, New York 18, N. Y. Price $6.00.

This book shows how to calculate heating and cooling loads, and how to heat, cool, ventilate and otherwise condition air in any building. Selection of equipment, automatic controls, and the design of air ducts and liquid piping systems are thoroughly covered. Refrigeration theory, application and equipment selection are also included. The book contains all the tables necessary for elementary design work, although complex theory and higher mathematics have been eliminated. It is an excellent reference book for those actively engaged in air conditioning and refrigeration work, and will be a valuable guide to those entering the field.

Anatomy of Depreciation, by Luther R. Nash (S.B., S.M.), Public Utilities Reports, Inc., 225 pages, 5½ x 8 inches, illustrated, $5.00.

A discussion of public utility depreciation accounting methods, with reference to present controversies between regulatory agencies and utilities, and suggestions for future simplifications.

Industrial Furnaces. Bulletin A-100 issued by The Gas Machinery Company, 16114 Waterloo Road, Cleveland 10, Ohio describes in text, photos and diagrams several types of gas fired furnaces. These include radiant tube, car type, rotary hearth, box type, etc., for temperatures up to 2500° F. Featured in the folder are silicon carbide refractory tubes for controlled atmospheres. Installations of these furnaces can include auxiliary equipment. Bulletin sent on request.

Earth Boring Machines. A newly issued 16-page bulletin is announced by the Hydrauger Corporation Ltd., 116 New Mongomery St., San Francisco. According to E. D. Rogers, manager, the time and labor saving advantages of these horizontal earth boring machines seem more important today than ever. The three new compressed-air operated models 10-A, L-2, and LHH-2 (a radical new, hand-held model) are fully covered in the new bulletin.

Sound-Slide Film on Water Heating

"Hot Water Helps," a 14-minute sound-slide film produced by Portland (Ore.) Gas & Coke Company to promote a not easily demonstrated service—automatic gas water heating—is now offered for use generally by utility home service, residential sales, and sales promotion divisions.

The Portland utility is offering to share the film with the gas industry at approximate cost—$35 for a print and recording, according to Fred M. Kimball, promotion manager. The price includes the purchasing utility's name on the first frame and the recording opens with the words, "Your Gas Company Presents. . . ."

The film's "premier" was a feature of the American Gas Association's and Pacific Coast Gas Association's "Home Service Workshop" on Mt. Hood, in Oregon. Advance showings were held in New York and San Francisco where the production was well received by personnel of both associations, each of which has a print in its offices.

Developed primarily for use by home service girls before women's groups, at the suggestion of Rita Calhoun, home service director, the film has been found useful in other ways, according to Kimball. Because the continuity contains information which tends to make those who view the film "hot water experts," it is especially valuable in sales training work, company or dealer.

Four basic aims were set up for the film, Kimball explained, and he outlined them as follows:

1. To include purely educational material, so that an audience would not leave with the feeling of having received only a sales talk. An example is enlightening, up-to-date laundry information on the advantages of a short soak in hot suds, as against the long-accepted belief that hot water sets dirt. Correct bath-water temperatures also are stressed.

2. To promote additional use of hot water even by those already having automatic water heating, and with no attempt in doing so to avoid embarrassing slow-recovery, competitive services. An example of stimulating hot water usage, and thereby revenues, is the tip that using tempered water when washing vegetables will keep the hands from getting "miserable and blue."

3. To sell automatic gas water heating even to the point of including gas-fired tank water heaters as competition! Even the old wood stove with waterback is not forgotten. Portland is a highly competitive area and no punches are pulled!

4. To promote automatic gas-fired clothes dryers as a powerful ally to the automatic gas water heater in keeping the domestic load well balanced in favor of gas.

"Hot Water Helps" opens with Mrs. Reade, whose home includes the latest in time and labor-saving home laundry equipment, answering the doorbell to find Mrs. Grayson, a Monday morning caller who drops in while waiting for her competitive automatic water heater to "recover" from the morning baths before even thinking of her washing!

The ensuing conversation affords a wealth of opportunities to bring in casual, but none the less potent, sales slants for automatic gas water heating as a household necessity. The caller is greatly impressed by the abundance of hot water always on tap, and becomes obviously conscious of the shortcomings of her own water heater. A dishwashing sequence in the midst of home laundry activity still further emphasizes the superiority of the automatic gas water heater.

Included among the production's 54 frames are 16 cartoons which inject bits of humor at opportune times to help put over points. A few well chosen diagrams and cut-away photographs bring out some of the fundamentals of the automatic gas water heater and thereby explain its inherent superiority over other services. The heater that "stars" in the picture is disguised as to brand.

Complete details, including a copy of the entire script, may be obtained by contacting Fred M. Kimball, promotion manager, Portland Gas & Coke Company, Public Service Bldg., Portland 4, Oregon.

"Tip Plan" Works

With its recently revived "tip plan" off to a good start, Portland (Ore.) Gas & Coke Company reported 588 paid for 470 range and water heater sales made during April, May and June to prospects not previously known to the Commercial department and which were submitted by its own people and members of their famiiles.

Tips submitted during the three month period totaled 1425, but the fact that some were for both ranges and water heaters boosted the actual total of appliance prospects to 1639. Sales count whether made by the Company or through authorized dealer or plumber and whether the appliance is new or used. However, for the present the plan is limited to ranges and water heaters.

With a "horse race" as the theme, the plan was announced to the Gasco family through its house organ, The Blue Flame, and a colorful folder which was mailed to the homes. In addition to creating interest in the plan by means of appropriate cartoons and such catch-lines as "They're off. . . . Place your bets. . . . Get in on the winnings," the folder also included a book of a "dope sheet" convenient to carry forms for getting right down to business and "placing bets!"

The "Bets" or prospects "pay off" at the rate of $1.00 net for each appliance sale. A prospect is good for a 60-day period, provided it observes the "Rules of the track," an important one being that the prospect is not a duplicate and has not been worked by a salesman. Provision is made, however, for re-activating a prospect if it shows new life. If a "dope sheet" is checked only for a range and the customer also purchases a water heater, full credit is given for both and "all bets paid!"

As before the war, the prospect plan is operated by the Commercial department which maintains contacts with the other departments in the Company by means of team captains. "Dope sheet" books contain sufficient sheets for submitting 10 prospects and are numbered consecutively so that when the next to last "tip" is received by the prospect clerk a new book is automatically mailed to the home. New employes are mailed details of the tip plan by the paymaster.

Personnel Changes at Portland (Ore.) Gas & Coke Company

Appointment of Ray H. Glassley as assistant to Personnel Director George Mackenzie was recently announced by President Paul B. McKee.

Publication and public information activities formerly under John Dierdorff have been transferred to Personnel, where they are under the general supervision of Glassley.

Advertising is now headed up by R. G. Barnett, vice-president and general manager, with McCann-Erickson continuing as the agency and Margaret Griffith working on Gasco advertising.

Don Johnston remains as editor of the Blue Flame, working with Glassley in the Personnel department.

Also it is announced by E. L. Hall, vice-president and chief engineer, that Karl G. Steinbeck is the new superintendent.

Steinbeck comes to Gasco from Los Angeles where he was superintendent of Southern California Gas Company's butadiene plant since 1942.

Catalogs

Jet Compressors. Schutte and Koerting Company announce a new 12 page catalog covering jet compressors. Pictures and text describe the various type steam and gas jet compressors, together with a section on their construction and operation.

Tables and drawings give complete information on dimensions, connection sizes and weights of the different types. Colored diagrams with detailed explanations describe typical applications of jet compressors in numerous industries, such as paper making, vulcanizing, various chemical industries and gas plants.

Copies may be obtained by writing for "Bulletin 4F" to Schutte and Koerting Company, 12th and Thompson Streets, Philadelphia 22, Pennsylvania.

Automatic Regulator Control. The Norwalk Smyly Mercury Loader, its functions, applications and details of operation are illustrated and described in Bulletin 9000 issued by Norwalk Valve Company, 35 Railroad Ave., South Norwalk, Conn.

This loader is adaptable to many types of regulators, increasing or decreasing pressure on the diaphragm with variation in sendout. Operation is automatic and eliminates manual loading. Copy of bulletin on request.

Rotary Pumps. Catalog 947 of George D Roper Corporation, Rockford, Ill., describes in considerable detail their rotary pumps for manufacturing and process industries. The several series cover pressures up to 1000 lbs. p.s.i. Bulletin 3060 gives useful information on how to select the proper pump for specific use and includes many useful tables and data for the engineer. Both mailed on request.

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